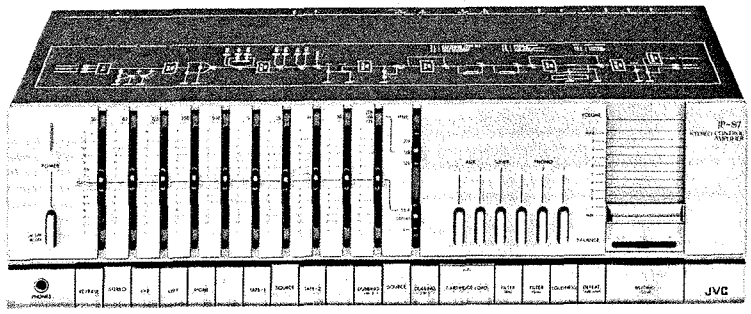
JVC

SERVICE MANUAL

MODEL JP-S7

SEA

STEREO CONTROL AMPLIFIER



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Contents

Page

1. Specifications 2
2. New Technical Information
   - 2-(1) Block Diagram 3
   - 2-(2) Equalizer Amp. Circuit 3
   - 2-(3) Equalizer Input Switching Circuit 4
   - 2-(4) Semiconductor "L" Circuit 5
   - 2-(5) Audio Muting Circuit 6
3. Adjustment Procedure and Safety Precautions
   - 3-(1) Regulated Voltage of Power Supply P.C. Board 7
   - 3-(2) Safety Precautions 7
4. Removal of Top Cover, Bottom Plate and Front Panel
   - 4-(1) Top Cover and Bottom Plate 8
   - 4-(2) Front Panel 9
5. Removal of P.C. Board Ass'y and Pushbuttons Ass'y
   - 5-(1) TSC-41A S.E.A. Control P.C. Board Ass'y 10
   - 5-(2) TSC-42A Input Selector P.C. Board Ass'y 10
   - 5-(3) TAC-388A S.E.A. & Flat Amp. P.C. Board Ass'y 10
   - 5-(4) TAC-390A and TAC-391B Switch P.C. Board Ass'y 10
   - 5-(5) Pushbuttons Ass'y 11
6. Main Parts Location and Part Numbers 12
7. Exploded Views and Parts List
   - 7-(1) Front Panel 13
   - 7-(2) Rear Panel 17
   - 7-(3) Chassis Base 18
8. Printed Circuit Board Ass'y Part Locations and Parts List
   - 8-(1) TSC-39A Level Volume P.C. Board Ass'y 19
   - 8-(2) TPS-40A Power Supply P.C. Board Ass'y 19
   - 8-(3) TSC-40A Recording Terminals P.C. Board Ass'y 21
   - 8-(4) TSC-41A S.E.A. Control P.C. Board Ass'y 22
   - 8-(5) TSC-42A Input Selector P.C. Board Ass'y 23
   - 8-(6) TSC-44A Base P.C. Board Ass'y 24
   - 8-(7) TAE-116LA Equalizer Amp. P.C. Board Ass'y 25
   - 8-(8) TAE-116RA Equalizer Amp. P.C. Board Ass'y 28
   - 8-(9) TAP-250B Buffer Amp. & Headphones P.C. Board Ass'y 31
   - 8-(10) TAC-388A S.E.A. & Flat Amp. P.C. Board Ass'y 33
   - 8-(11) TAC-389A Semiconductor "L" P.C. Board Ass'y 35
   - 8-(12) TAC-390A Switch P.C. Board Ass'y 38
   - 8-(13) TAC-391B Switch P.C. Board Ass'y 39
9. Accessories List 40
10. Packing Materials and Part Numbers 40
11. Transistor, I.C. and Diode Lead Identification 41
12. Schematic Circuit Diagrams 42

1. Specifications

Dimensions	:	57.8cm(W) x 16.25cm(H) x 26.8cm(D) (22-3/4" x 6-13/32" x 10-17/32")
Weight (Net)	:	8.7kg (19.1 lbs)
Input Section		
Input Sensitivity		
PHONO-1, 2, 3	:	2.0mV (Level controls for PHONO-2 and 3)
TUNER	:	200mV
AUX-1, 2 (PLAY)	:	200mV (Level Controls)
TAPE-1, 2 (PLAY)	:	200mV
Input Impedance		
PHONO-1, 2, 3	:	33k, 47k, 100k ohms selectable (Capacitance: OFF, 100pF, 330pF Selectable)
TUNER	:	80k ohms
AUX-1, 2	:	70k ohms
TAPE-1, 2 (PLAY)	:	50k ohms
Maximum Input		
PHONO-1, 2, 3	:	350mV (RMS) at 1kHz
TUNER, AUX-1, 2	:	35V
Output Section		
Rated Output		
OUTPUT-1, 2	:	1.0V (Level control for OUTPUT-2)
TAPE-1, 2 (REC)	:	200mV
Output Impedance		
OUTPUT-1, 2	:	600 ohms
TAPE-1, 2 (PIN)	:	80 ohms
TAPE-1, 2 (DIN)	:	70k ohms
Total Harmonic Distortion		
5V output	:	0.05% (1kHz)
1V output	:	0.02% (1kHz)
Signal to Noise Ratio (at Rated Output)		
PHONO-1, 2, 3	:	65dB (RMS) 75dB (IHF A-short circuit)
TUNER	:	86dB (RMS) 96dB (IHF A-short circuit)
AUX-1, 2	:	86dB (RMS) 96dB (IHF A-short circuit)
TAPE-1, 2	:	86dB (RMS) 96dB (IHF A-short circuit)
Frequency Response		
PHONO-1, 2, 3	:	20 – 20kHz (±0.3dB from RIAA curve)
TUNER	:	15Hz–100kHz (+0, -0.5dB)
AUX-1, 2	:	15Hz–100kHz (+0, -0.5dB)
TAPE-1, 2	:	15Hz–100kHz (+0, -0.5dB)
Headphones Impedance	:	8 ohms–2k ohms
Controls Section		
S.E.A. Center Frequencies	:	32Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz and 8kHz 12kHz/16kHz/20kHz (Switchable)
S.E.A. Control Range	:	±12dB
S.E.A. Defeat	:	14dB Amp.
Loudness	:	+8dB at 100Hz, +4dB at 10kHz (-30dB volume control)
Muting Filter	:	-20dB
Filters		
Subsonic	:	18Hz (-12dB/oct.)
High	:	9kHz (-6dB/oct.)
Power Supply Section		
Power Muting	:	From power ON to output ON: 3 sec. From power OFF to output OFF: 40 msec.
Power Sources		
U.S.A. & Canada	:	120V/60Hz
Europe (Continent)	:	220V/60Hz
U.K. & Australia	:	240V/50Hz
Other Countries	:	Selectable
AC Outlets		
Switched	:	2 (200W)
Unswitched	:	2 (500W)
Power Consumption	:	27W

2. New Technical Information

2-(1) Block Diagram

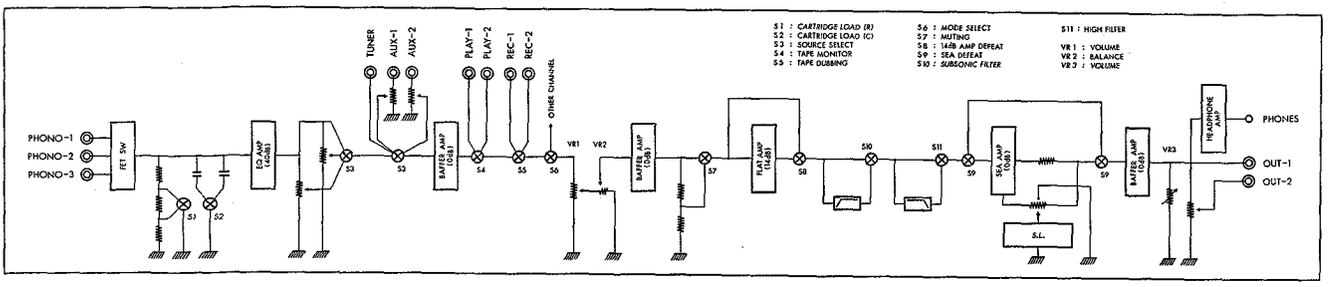


Fig. 1

2-(2) Equalizer Amp. Circuit

Application of a ±59V high voltage to a circuit including a total class A pure complementary push-pull output stage allows a high gain of 40dB at 1kHz while providing a large permissible input, more than 350mV in input dynamic range.

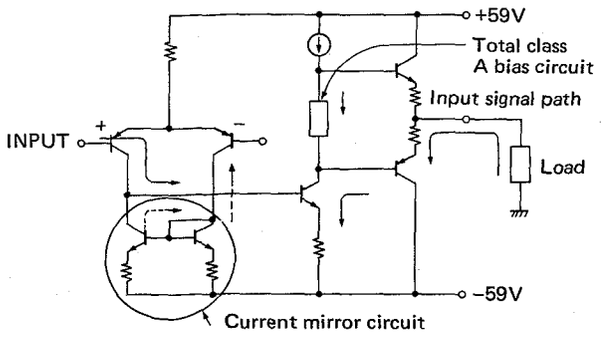


Fig. 2 Equalizer block diagram

The circuit is constructed as shown in the diagram. The process from the differential amplifier and current mirror circuit in the first stage through the class A single amplifier to the total class A complementary push-pull emitter follower output stage, forms a three stage direct-coupled equalizer. As shown in the diagram, the output current of each amplifier provides the driving current for the next stage, thus making the equalizer amplifier a total current amplifier system. Current loss at each amplification stage is quite small. (In contrast, a normal RL amplifier loses a part of the signal due to higher circuit resistance.) A surprising net gain of 115dB or more is obtained (60–90dB with normal circuit construction) and an almost fixed NFB of 70dB is applied from high to low frequencies. Gain characteristics cannot be improved even with increased NFB unless the characteristics are improved prior to applying NFB. However, NFB quantity and improvement to characteristics can be considered to be in proportion, since the net characteristics must be excellent in order to supply a strong, stable NFB.

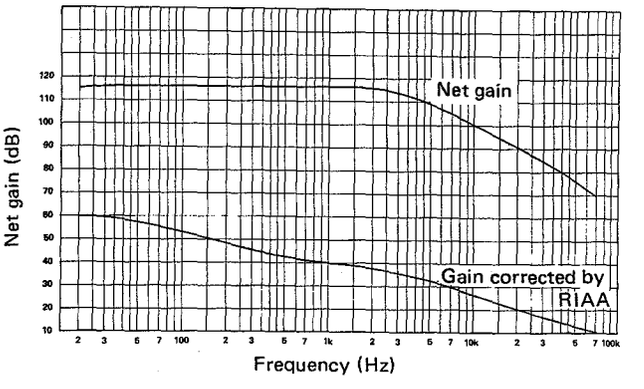


Fig. 3 Net gain characteristics

The next diagram shows a current mirror circuit. Its name comes from the fact that the I1 and I2 operate as if they reflected each other on a mirror. By utilizing it as the load of the first stage differential amplifier, both outputs can be utilized as driving current for the next stage. Since one of them (current indicated by dotted line in Fig. 2) isn't utilized normally, the differential amplifier capacity can be doubled to twice that of a normal RL amplifier.

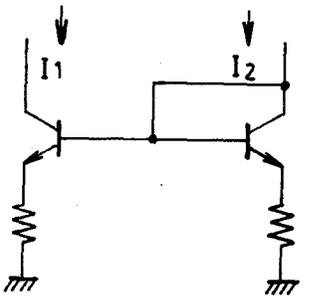


Fig. 4 Current mirror circuit

The next stage class A single amplifier load is the fixed current source, and all of its output current is used to drive the next stage pure complementary push-pull emitter-follower, thus realizing effective, low distortion amplification. And even greater current amplification is performed by a total class A biased pure complementary push-pull emitter follower to drive the load with low output impedance.

Thus, an amplifier design faithful to the principle that transistors work on current delivers excellent results.

Of course, the main function of the pre-amplifier is to faithfully amplify the signals picked up from the complicated record groove and to send them to the power amplifier. To do this, it is necessary to amplify every output signal of the cartridge faithfully. Therefore, excellent transient response and wide dynamic range are mandatory.

To satisfy these requirements, the equalizer of this amplifier was designed with a new idea of "maximum output voltage bandwidth" – and we tried to expand it as wide as possible. The results are indicated in Fig. 5, where you can clearly see the drastic improvement compared with examples of previous amplifiers. Since its distortion is fixed at 0.1%, the bandwidth in which the maximum output voltage is available would become narrow without all-round excellence with regard to quantity, range and stability of NFB. Then it can be said that the less difference there is between the curve with the distortion fixed at 0.1% and the clipping point curve, the better the circuit. Also the application of ±1% resistance accuracy metal film resistors and ±2% resistance accuracy styrol capacitors to the equalizer's most important part, where the RIAA characteristics are produced, produce excellent characteristics. Deviations from the RIAA curve are ±0.2dB for 30–15,000Hz and ±0.3dB for 20–20,000Hz.

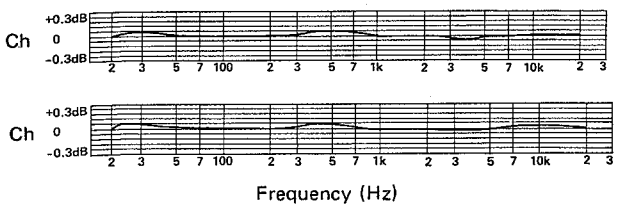


Fig. 5 Deviations from the RIAA curve (measured value)

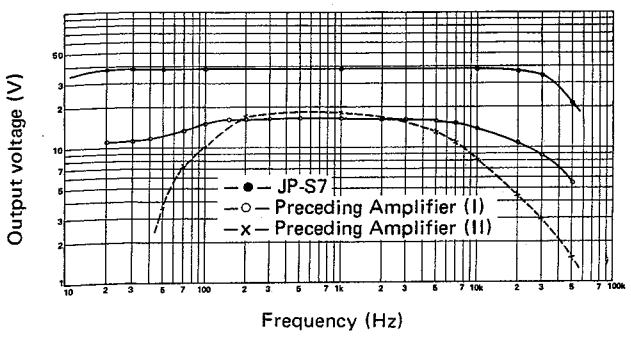


Fig. 6 Maximum output voltage range

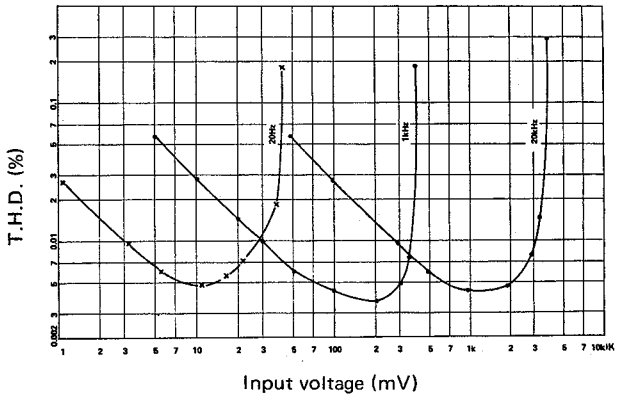


Fig. 7 Input voltage/Distortion characteristics

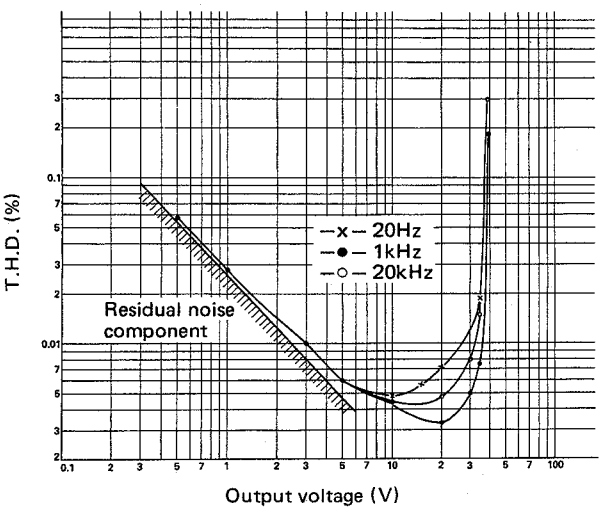


Fig. 8 Output/Distortion characteristics

2-(3) Equalizer Input Switching Circuit

The maximum gain of this amplifier from equalizer input to speaker output is, assuming that the gain of the power amplifier is 30dB, a surprising 122dB for 60Hz, 96dB for 1kHz and 82dB for 10kHz signals. Therefore, consideration should be given to the S/N ratio, click noise, dynamic range and distortion of the equalizer input switching circuit. To attain this purpose, this circuit adopts MOS FET DIP IC.

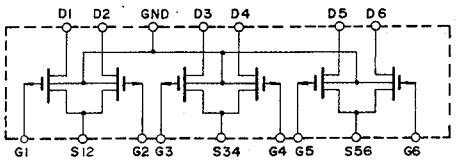


Fig. 9 Equivalent circuit for MOS FET DIP

This IC has 6 MOS FET's, two of which can be used at a time in parallel for switching PHONO-1, 2 and 3.

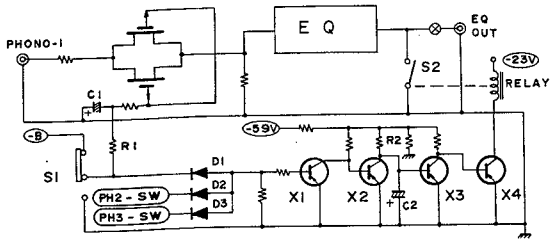


Fig. 10 Input switching circuit (GND terminal is omitted.)

When PHONO-1 switch is switched on and the S1 voltage changes from 0 to −22V, the step wave, decay of which has become slow due to the time constants of R and C, is loaded on the FET gate and PHONO-1 goes ON. With this operation, PHONO switches 2 and 3 are released, PHONO-2 and 3 gate voltage becomes 0 and the PHONO-2 and 3 circuits go OFF. Switching to PHONO-2 at this point changes the S1 voltage from −B to 0 and momentarily opens the gate circuit in the middle of the operation. Since diodes D1, D2 and D3 are connected to the same point on PHONO-1, 2, 3, one will go ON when the source switch is set to PHONO. However, all of the PHONO-1, 2 and 3 circuits go OFF for a moment when the PHONO switches are switched on. When this occurs, a pulse is applied to the X1 base. Then, the operation of the circuit shown in Fig. 9 is as follows:

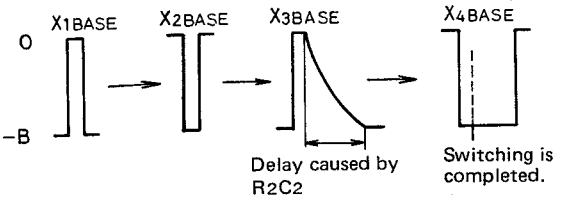


Fig. 11 Relay circuit operation

This figure illustrates how reed relay S2 is shorted when the PHONO switch is shifted from PHONO-1 to PHONO-2, and goes OFF shortly after switching is completed. Distortion and dynamic range of the input switching circuit is as shown below.

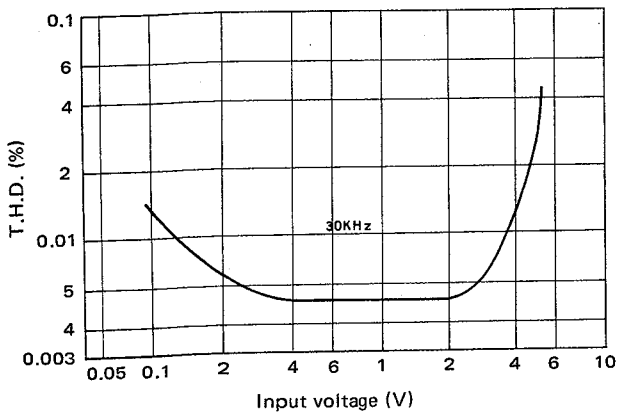


Fig. 12 MOS FET switching characteristics

2-(4) Semiconductor "L" Circuit

The operation of semiconductor L is described using its basic circuit.

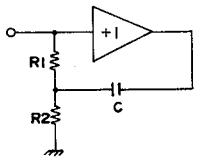


Fig. 13 Basic circuit

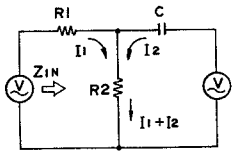


Fig. 14 Equivalent circuit

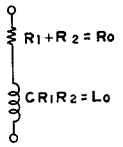


Fig. 15 Equivalent circuit

Assuming that the input and output impedances of an amplifier having a gain of +1 as shown in the basic circuit are infinity (∞) and zero (0) respectively, then an equivalent circuit such as that shown in Fig. 14 is obtained. The manner in which input impedance Zin varies with the different frequencies in this circuit will now be examined. According to the diagram,

$$V - R_1 I_1 = R_2 (I_1 + I_2) \quad \ldots\ldots\ldots\ldots\ldots (1)$$

$$V - \frac{I_2}{j\omega C} = R_2 (I_1 + I_2) \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Solving equation (2) for I_2 and substituting it for equation (1), the rearranged expression is obtained by

$$V = I_1 (R_1 + R_2 + j\omega C R_1 R_2) \quad \ldots\ldots\ldots\ldots (3)$$

Therefore,

$$Zin = R_1 R_2 + j\omega C R_1 R_2 \quad \ldots\ldots\ldots\ldots\ldots (4)$$

since input impedance Zin equals V/I_1. This is the equation for the impedance of a coil having a d.c. resistance $R_1 + R_2$ and inductance CR_1R_2. This means that the basic circuit shown in Fig. 13 function as a coil. (Fig. 15)
In order to develop this for practical applications, an amplifier must be obtained which meets the prerequisites of the first assumption (gain = +1, input, impedance = infinity, output impedance = 0). This suggests the use of an emitter-follower circuit.

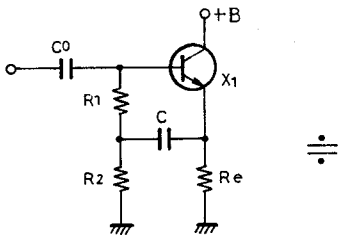


Fig. 16 Semi-practical circuit

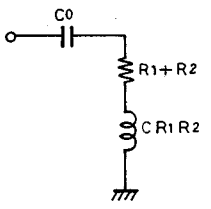


Fig. 17 Approximate circuit

In this circuit, resonance frequency fo, circuit Oo and the impedance at resonance Ro are as follows when R1 = R2:

$$fo = \frac{1}{2\pi\sqrt{LC_0}} \doteqdot \frac{1}{2\pi\sqrt{CR_1R_2C_0}} = \frac{1}{2\pi R_1\sqrt{CC_0}} = \frac{\sqrt{\frac{C}{C_0}}}{2\pi CR_1}$$

$$\therefore\ 2\pi f_0 CR_1 = \omega CR_1 = \sqrt{\frac{C}{C_0}}$$

$$Q_0 = \frac{\omega CR_1R_2}{R_1 + R_2} = \frac{1}{2}\omega CR_1 = \frac{1}{2}\sqrt{\frac{C}{C_0}}$$

$$R = R_1 + R_2 = 2R_1$$

Since R1=R2=560Ω in practical circuits, even when 200 is obtained as hfe of X1, the input impedance is only about 0.56 x 200=100kΩ, and is far from infinity. Moreover, the dynamic range and S/N ratio are not satisfactory, since the a.c. load on X1 is 560Ω. Therefore, an emitter-follower circuit using one transistor cannot be used for practical applications. To solve this problem, we employed an inverted Darlington circuit in which a Darlington transistor is used in the last stage to increase the gain (hfe) and 100% negative feedback is applied. A 10mV current is supplied to the last stage to obtain sufficient dynamic range. These measures resulted in increased S/N, expanded dynamic range and exactly + 1 gain.

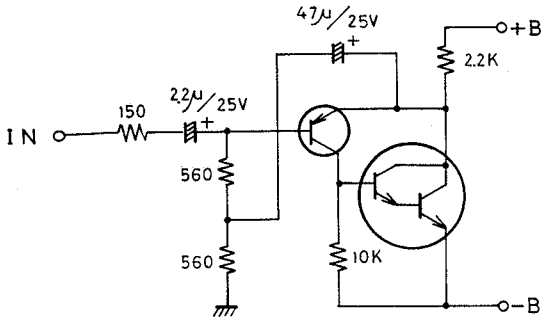


Fig. 18 Practical circuit (32Hz)

2-(5) Audio Muting Circuit

In order to eliminate noise caused by circuit instability following ON and OFF operations of the power switch, the amplifier is equipped with a circuit which suppresses the output for 3–4 second after the power switch is set to ON and cuts off power instantly when the switch is set to OFF. The circuit operation is described below.

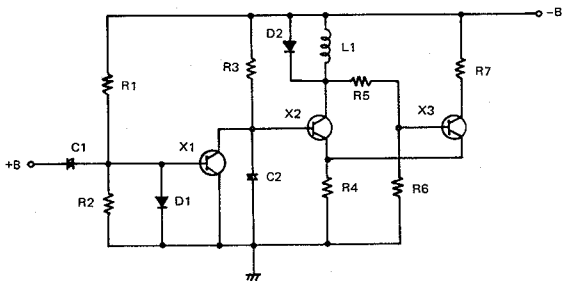


Fig. 19 Muting circuit

A reed relay is used for the L1 in the diagram to speed up the operation.

When switching power ON

The base of X2 is originally held at the ground potential by capacitor C2, making X2 OFF. Therefore, the X2 collector potential is approximately -B, X3 is biased by R5, R6 and the voltage Icx3 x R4 is present at both ends of R4. On the other hand, X2 is gradually biased at the time constant of R3 x C2. X2 and X3 form a Schmidt-trigger circuit which, when voltage applied to C2 exceeds (Icx3 x R4) + 0.6V, applies a voltage suddenly to X2 and reed relay L1, thus switching power ON.

When cutting power OFF

X1 is unbiased during the power ON operation, thus a voltage is not present. When power is switched off, ±B fluctuation occurs and a minus trigger pulse is produced by +B via C1. Applying the pulse to the base of X1 causes X1 to go ON and C2 to discharge. Then the voltage at the base of X2 instantly falls below the threshold level and X2 and X3 reverse circuit accelerates X2 to turn OFF. This releases reed relay L1 and cuts the power OFF. The time required for this process is 40–50msec.

3. Adjustment and Safety Precautions

3-(1) Regulated Voltage(Power Supply P.C.Board)

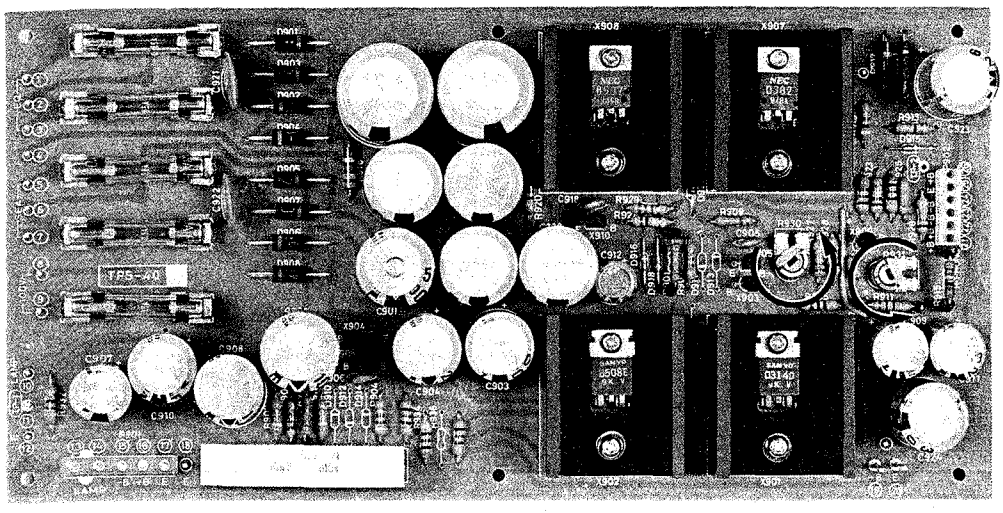


Fig. 20

Adjustment order	Points to be tested	Voltage measuring points (in the TPS-40A circuit board)	Rated voltage value
1	R930	Test point TP-1	+23.0V
2	Check	Check wiring terminal 19 or 23.	-23.0V
3	R931	Test point TP-2	+59.0V
4	Check	Check wiring terminal 24	-59.0V

1. Turn semi-fixed variable resistors R930, R931 located on Power Supply P.C. Board (TPS-40A) fully counterclockwise. Refer to Fig. 20.
2. Adjust R930 and R931 according to the steps listed above. Refer to Fig. 20.
3. In adjustment, slowly turn R930 and R931 clockwise from minimum setting position while refering to "Rated Voltage Value" in the diagram above.

3-(2) Safety Precautions

1. In handling power
   1) Make sure that all plug-in type P.C. Boards such as Equalizer Amp. (TAE-116LA, TAE-116RA), Buffer & Headphones Amp. (TAP-250B) and S.E.A. Amp. (TAC-388A) P.C. Boards are properly inserted in the connectors on the main panel with respect to direction and contact.
   2) Be sure that all wiring connections conform to the polarity indicated on the board.
   3) When replacing a fuse in the TPS-40A circuit board make sure that a fuse of the rating indicated on the board is employed.
2. When applying power
   1) First, make sure that each connector is properly connected to the terminal, then turn the master volume to minimum and switch the power on.
   2) The output will be delayed for a few seconds after the power switch is on. The output muting circuit is effective during this interval.
3. Application of power
   1) If, after turning the power switch on, wish to connect another unit to the input terminals of the unit or to reconnect a connector, be sure to turn the volume to minimum or switch the power off.
   2) Be sure to turn the power switch off before connecting speakers to output terminals.

4. Removal of Top Cover, Bottom Plate and Front Panel

4-(1) Top Cover and Bottom Plate

Procedures (Top Cover)

1) Make the unit up-side down, see Fig. 25. Remove 4 screws (B)
2) Remove 3 screws (A) located on Rear Panel. See Fig. 24.
3) Pull out Top Cover slightly (6 to 8cm) and lift it up. See Fig. 26.

Procedure (Bottom Plate)

1) Remove 8 screws (D) indicated on Bottom Plate. See Fig. 23 and 27.

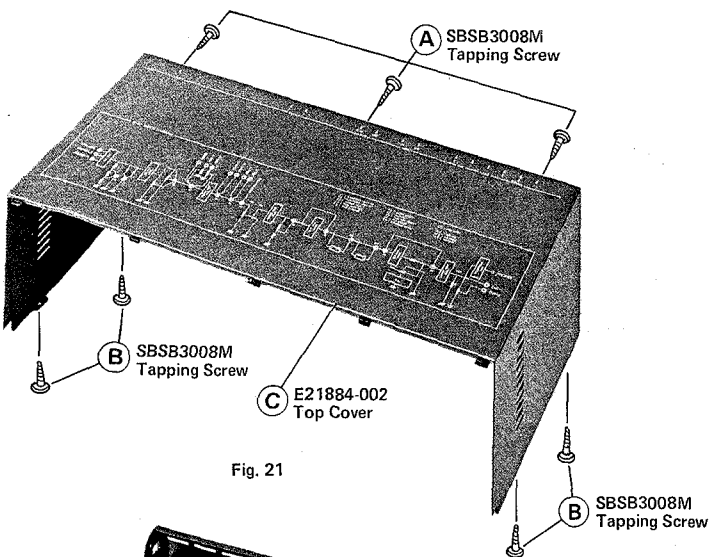


Fig. 21

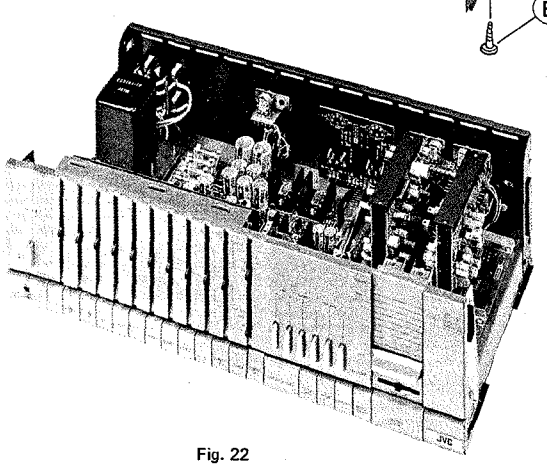


Fig. 22

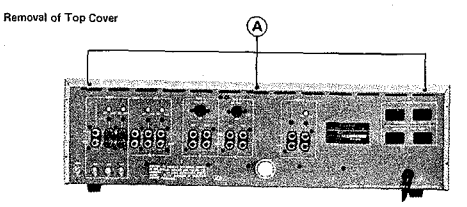


Fig. 24

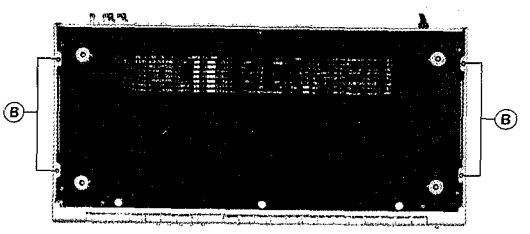


Fig. 25

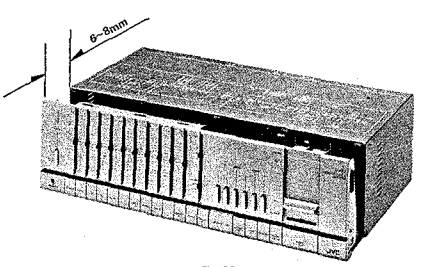


Fig. 26

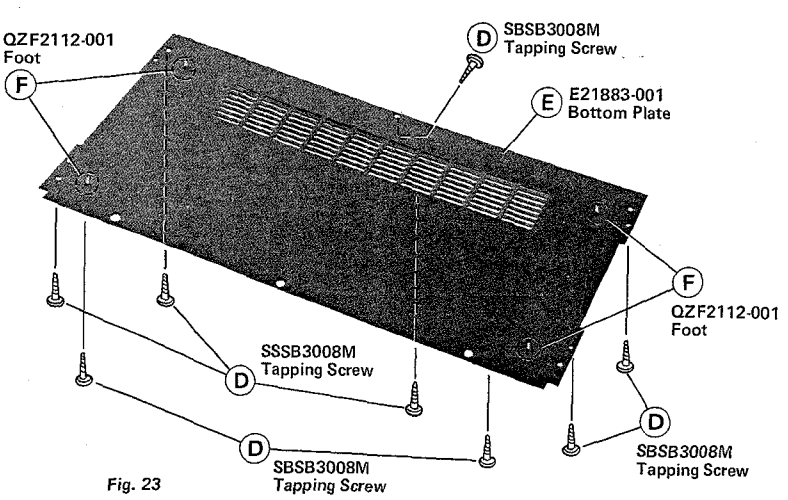


Fig. 23

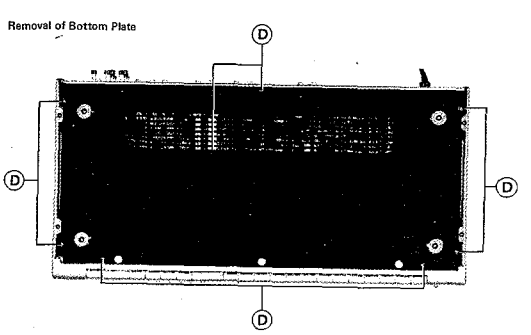


Fig. 27

4-(2) Front Panel

Procedures

1) Remove 3 screws Ⓓ located on Bottom Plate. See Fig. 29.
2) Remove 3 screws Ⓨ indicated on Fig. 28 and remove Bracket.
3) Remove 6 screws Ⓔ indicated on Fig. 28 & 30.
4) Remove 6 connectors Ⓕ indicated on Fig. 28.
5) Remove 2 screws Ⓖ indicated on Fig. 28 , then Front Panel Ass'y will be removable.

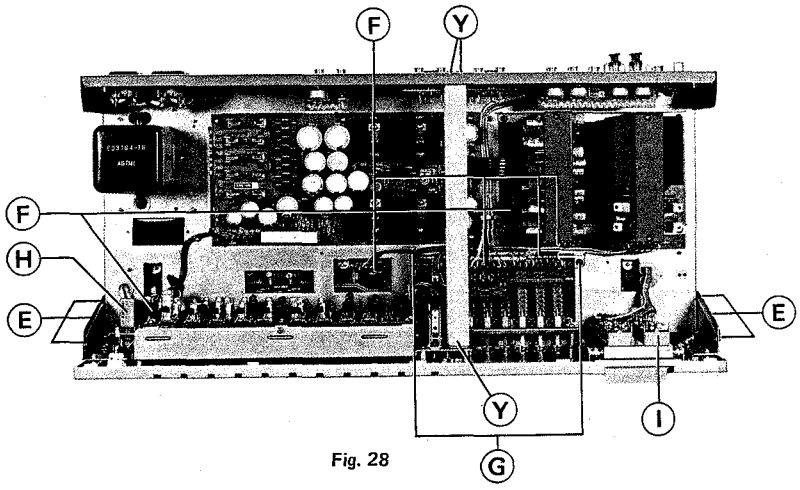


Fig. 28

Removal of Bottom Plate

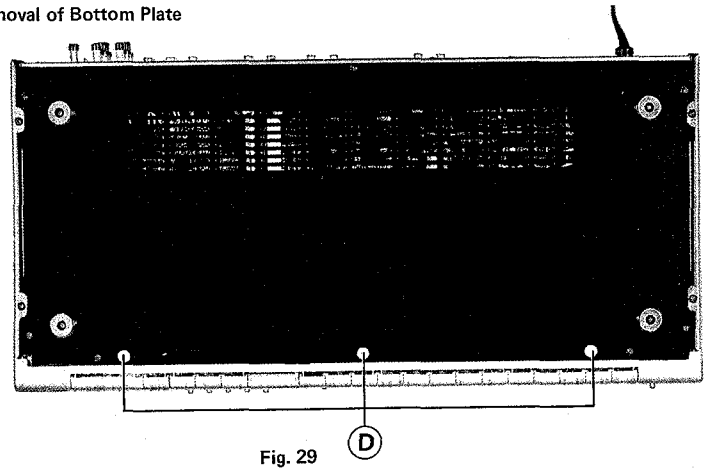


Fig. 29

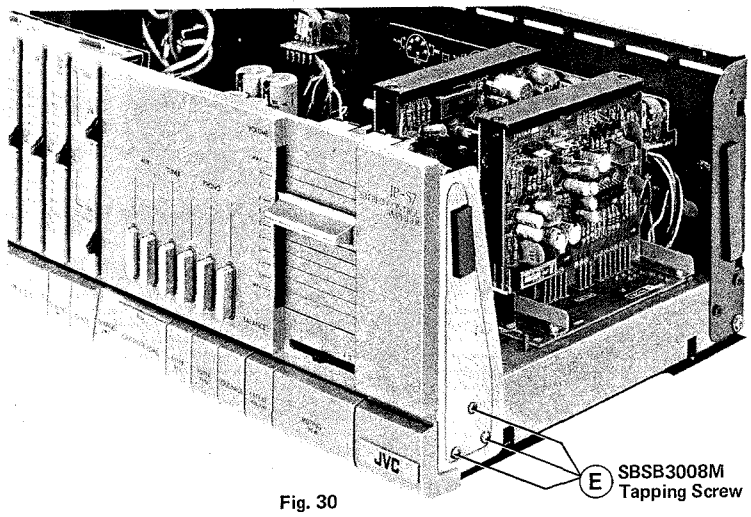


Fig. 30

5. Removal of P.C.Board Ass'y and Pushbuttons Ass'y

5-(1) TSC-41A S.E.A. Control P.C.Board Ass'y

1) Pull out S.E.A. Volume pushbuttons and S.E.A. Defeat pushbuttons carefully.
2) Remove 4 screws Ⓝ indicated on Fig. 32 and remove Bracket with Front Panel.

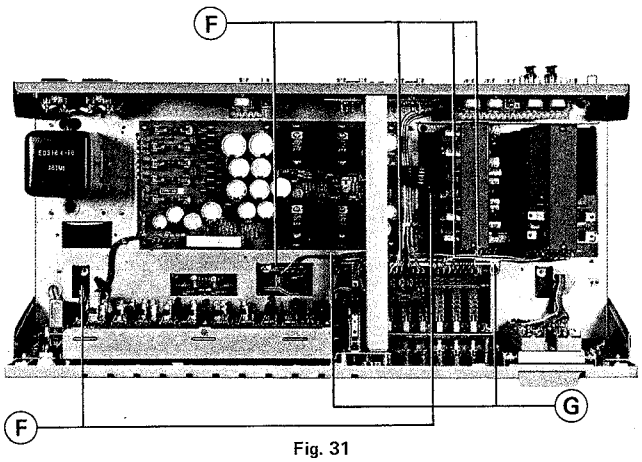


Fig. 31

5-(2) TSC-42A Input Selector P.C.Board Ass'y

1) Pull out S.E.A. Defeat Switch pushbutton carefully.
2) Remove 4 connectors Ⓕ indicated on Fig. 31.
3) Remove 2 screws Ⓖ indicated on Fig. 31 and remove 2 screws Ⓞ indicated on Fig. 32.

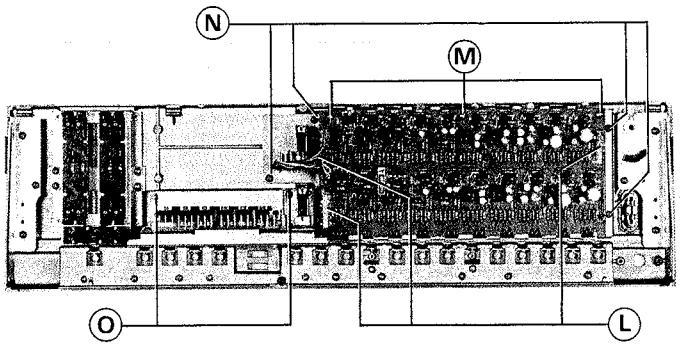


Fig. 32

5-(3) TAC-388A S.E.A. & Flat Amp. P.C.Board Ass'y

1) Remove 3 connectors Ⓛ indicated on Fig. 32.
2) Remove 3 screws Ⓜ indicated on Fig. 32, then will be serviceable.

5-(4) TAC-3090A and TAC-391B Switch P.C.Board Ass'y

1) Remove Top Cover, Bottom Plate and Front Panel. Refer to pages 8, 9.
2) Remove 2 screws Ⓟ indicated on Fig. 33 and 2 screws Ⓠ indicated on Fig. 34, then TAC-390A will be came out removable.
3) Remove 6 screws Ⓡ indicated on Fig. 33 and 3 screws Ⓢ indicated on Fig. 34, then TAC-391B will be removable.

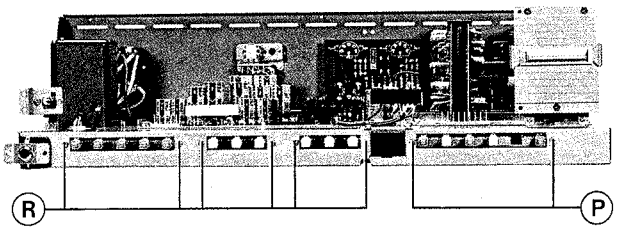


Fig. 33

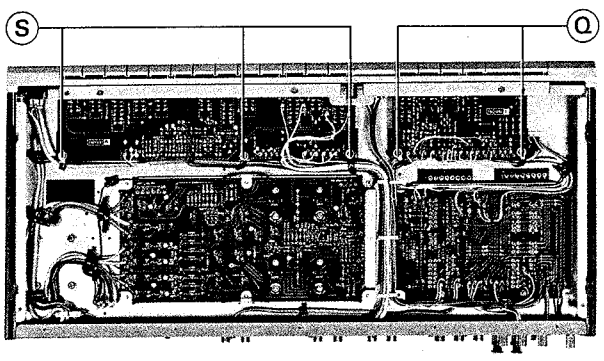


Fig. 34

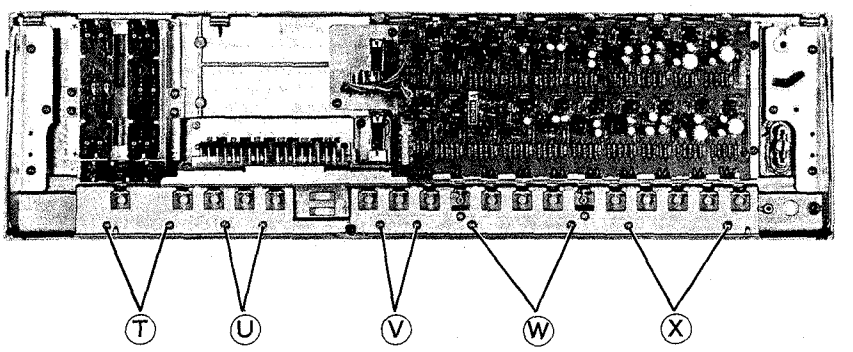
5-(5) Pushbuttons Ass'y

Procedures

1) Remove 2 screws Ⓣ indicated on Fig. 35 and -20dB Muting and 14dB Amp. Defeat Pushbuttons Ass'y will be removable.
2) Remove 2 screws Ⓤ indicated on Fig. 35, then Loudness 9kHz Filter and 18Hz Filter Pushbuttons Ass'y will be removable.
3) Remove 2 screws Ⓥ indicated on Fig. 35, then Damping Switch Pushbutton Ass'y will be removable.
4) Remove 2 screws Ⓦ indicated on Fig. 35, then Tape Monitor Switch Pushbutton Ass'y will be removable.
5) Remove 2 screws Ⓧ indicated on Fig. 35, then Mode Switch Pushbutton Ass'y will be removable.

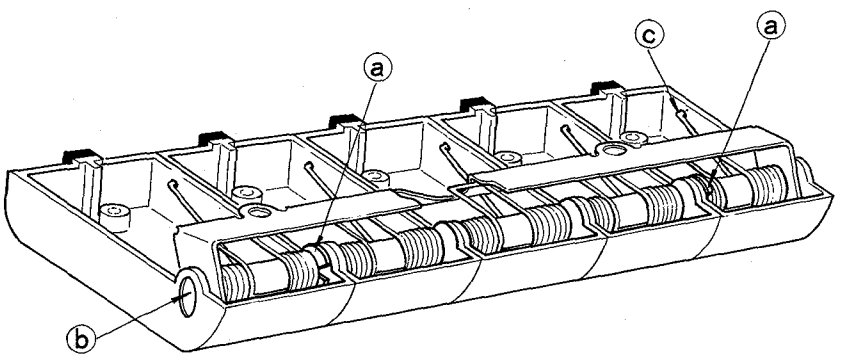
Removal of Pushbutton

1) Remove 2 rings ⓐ indicated on Fig. 36.
2) Pull out shaft ⓑ indicated on Fig. 36.
3) Remove spring (part of fook) ⓒ indicated on Fig. 36 from Pushbutton.



Rear View of Front Panel

Fig. 35



Pushbuttons Ass'y

Fig. 36

6. Main Parts Location and Part Numbers

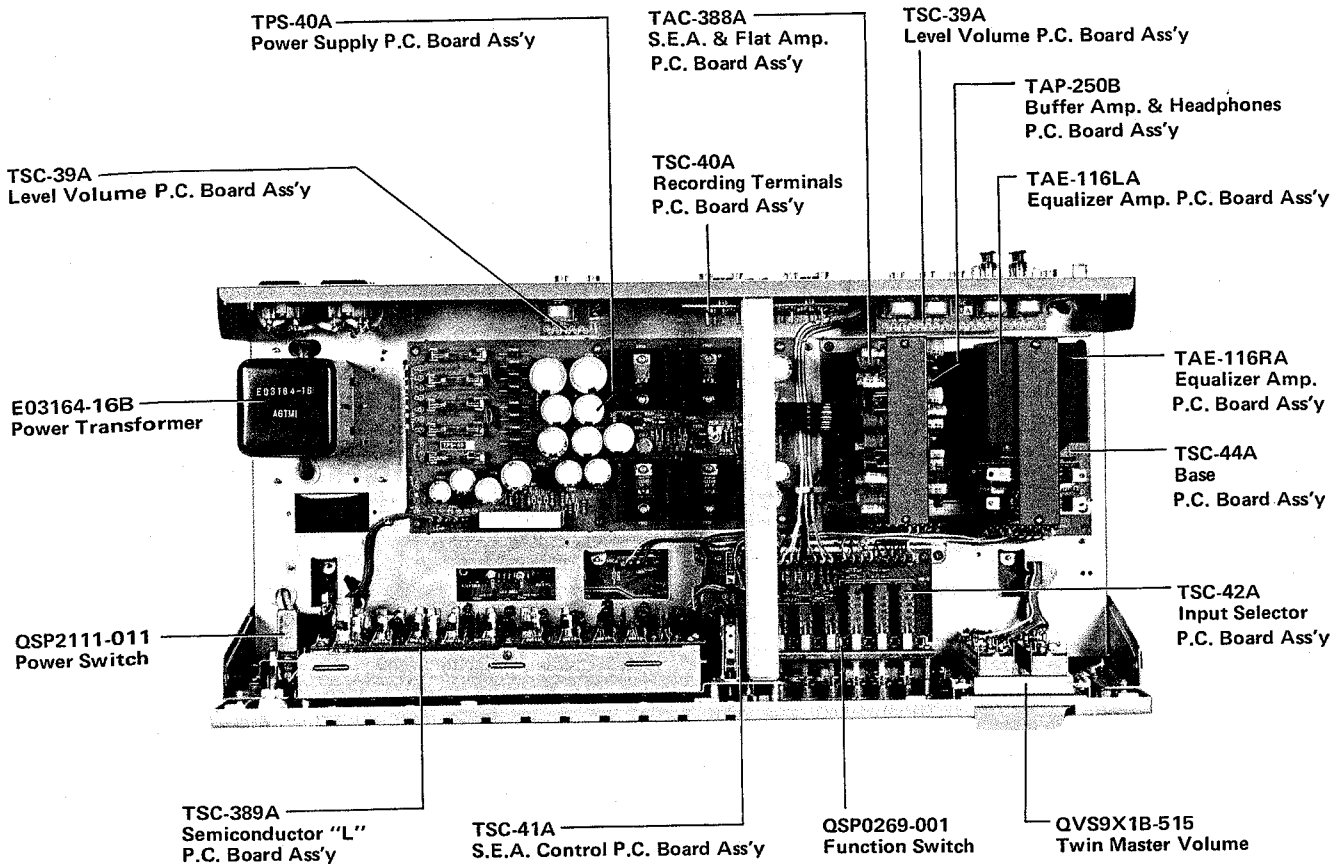


Fig. 37

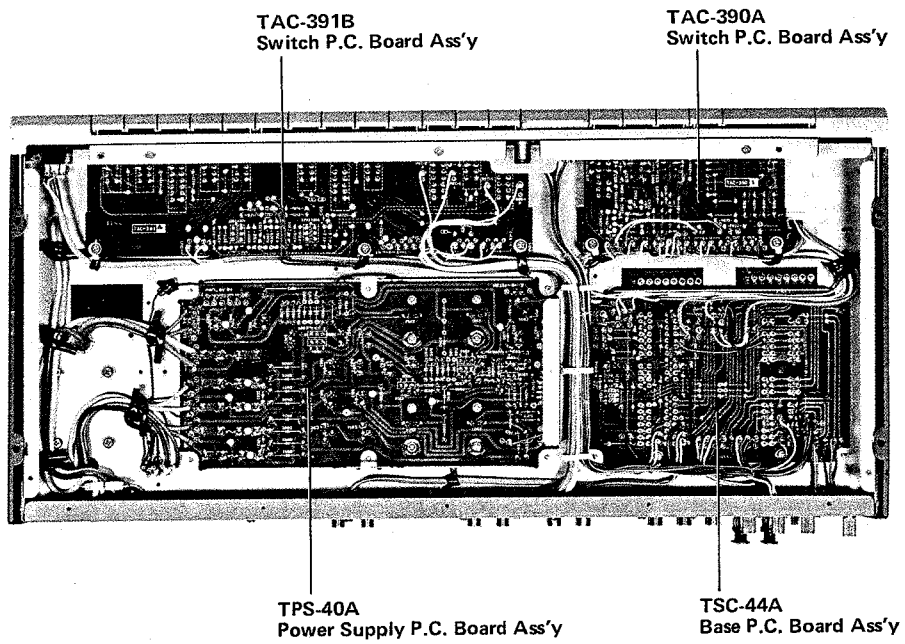


Fig. 38

7. Exploded Views and Parts List

7-(1) Front Panel (Front View)

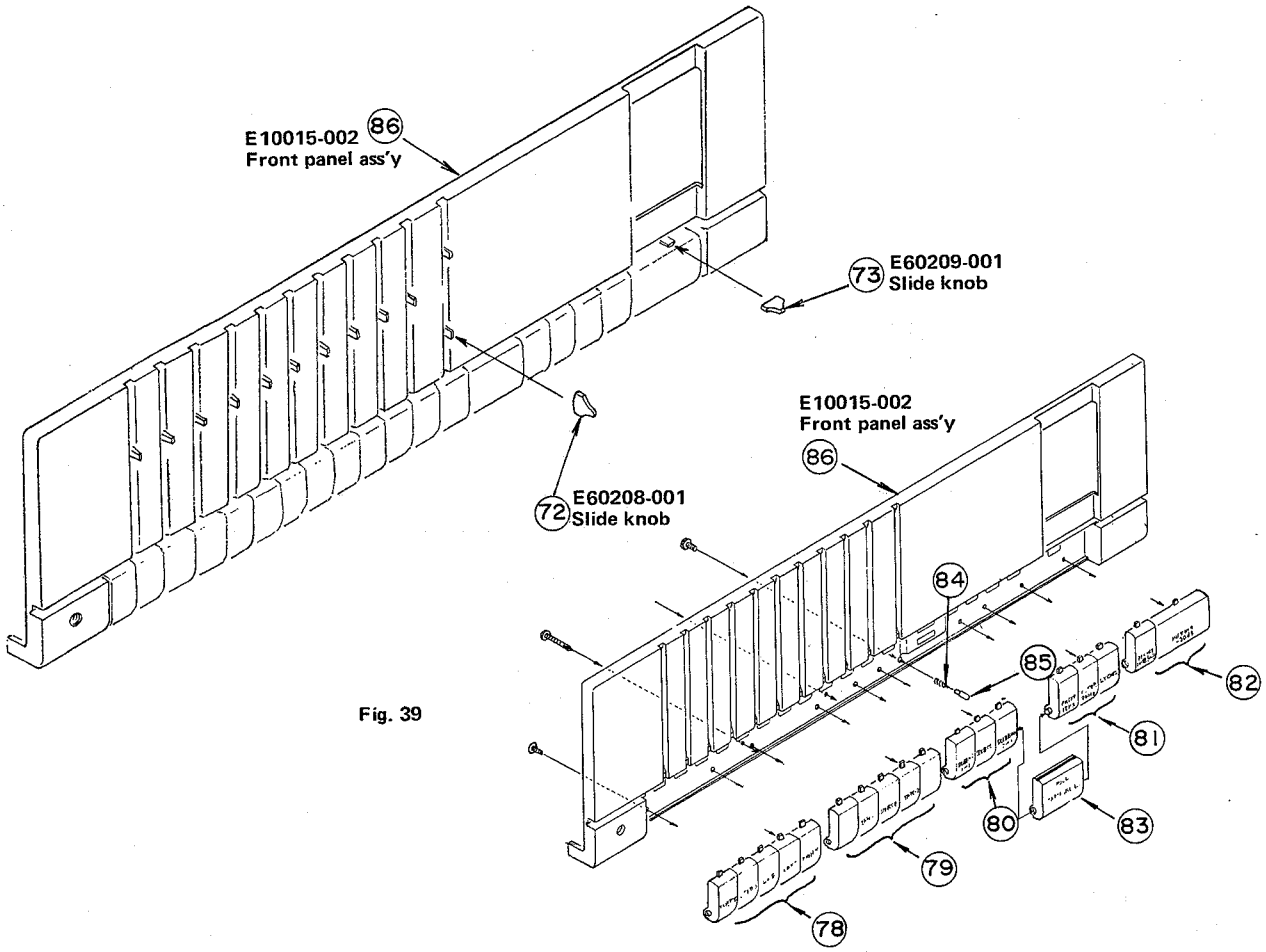


Fig. 39

Parts List

Item No.	Part Number	Rating	Description
78	E34185-002	Reverse	Push knob
	E34185-003	Stereo	"
	E34185-004	L + R	"
	E34185-005	Left	"
	E34185-006	Right	"
	E60192-001		Special spring
	E60191-001		Bracket
	E60190-001		Shaft
	REE3000		"E" ring
	E60211-001		Tube spacer
79	E34185-001		Push knob
	E34185-007	Tape-1	"
	E34185-008	Source	"
	E34185-009	Tape-2	"
	E60192-001		Special spring
	E60191-001		Bracket
	E60190-001		Shaft
	REE3000		"E" ring
	E60211-001		Tube spacer

Parts List

Item No.	Part Number	Rating	Description
80	E34185-010	Dubbing 1 ▶ 2	Push knob
	E34185-008	Source	Push knob
	E34185-011	Dubbing 2 ▶ 1	"
	E60192-001		Special spring
	E60191-002	Filter 18Hz	Bracket
	E60190-002	Filter 9kHz	Shaft
	REE3000	Loudness	"E" ring
	E60211-001		Tube spacer
81	E34185-012		Push knob
	E34185-013		"
	E34185-014		"
	E60192-001		Special spring
	E60191-002	Defeat 14dB	Bracket
	E60190-002	Muting	Shaft
	REE3000		"E" ring
	E60211-001		Tube spacer
82	E34185-015		Push knob
	E34186-001		"
	E60192-001		Special spring
	E60192-002		"
	E60191-003		Bracket
	E60190-003		Shaft
	REE3000		"E" ring
	E60211-001		Tube spacer
84	E60194-001		Coil spring
85	E60195-001		Pin
86	E10015-002		Front panel ass'y

Front Panel (Rear View)

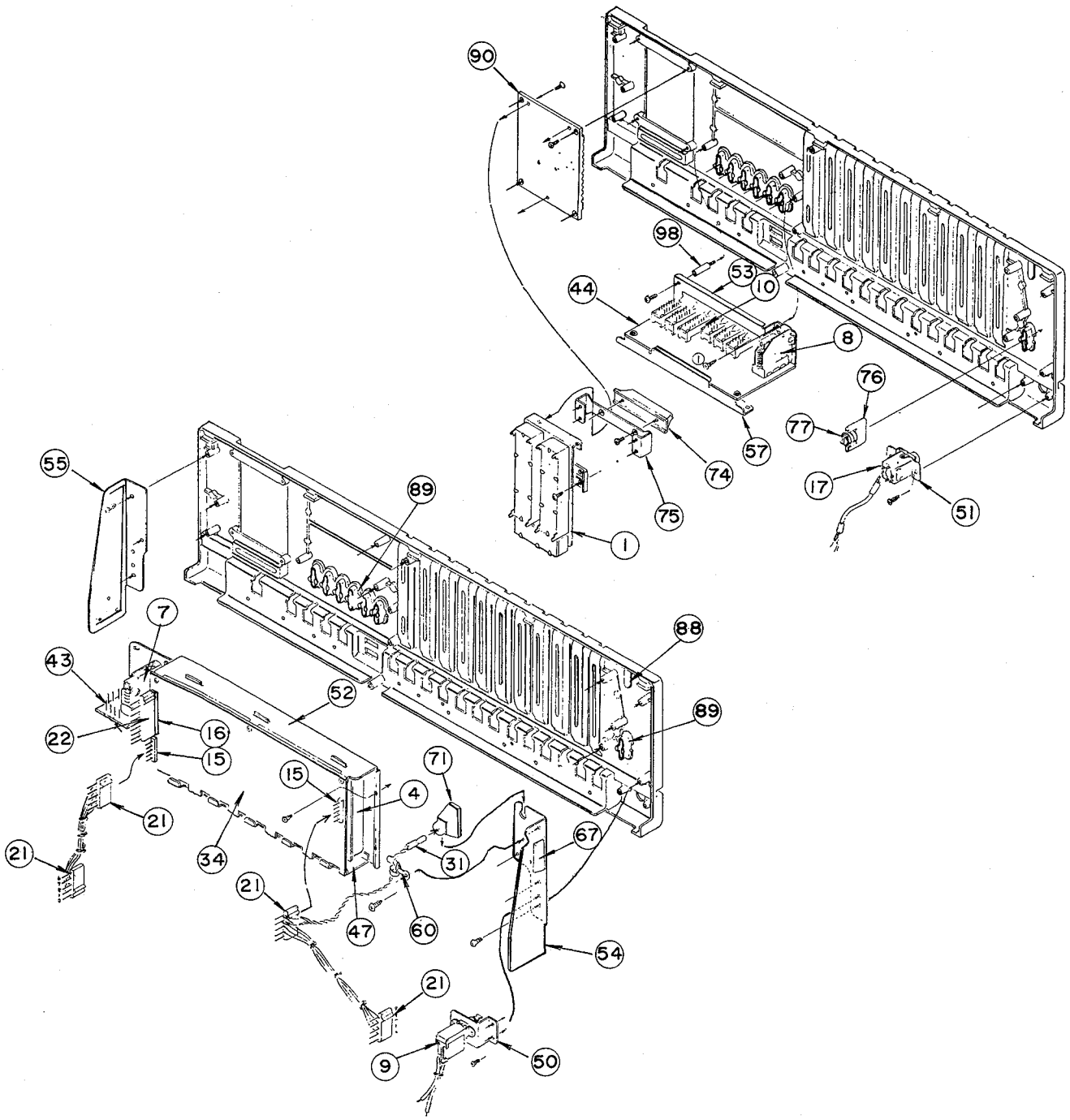


Fig. 40

Parts List

Item No.	Part Number	Rating	Description
1	QVS9X1B-515	150k(B) + 500k(B) + 250k(MN)	V. resistor
4	QVS7C2W-8F5	250k(W) S.E.A.	"
7	QSL0004-001		S.E.A. F change lever switch
8	QSL0005-001		S.E.A. defeat lever switch
9	QSP2111-011		Power push switch
10	QSP0269-001		Function push switch
15	E03628-5		5-pin plug
16	E03628-9		9-pin plug
17	E03468-002B		H.P. jack
21	E03565-5B0		5-pin socket
22	E03565-9B0	6V 100mA	9-pin socket
31	QLP3104-106		Pilot lamp
34	TAC-389A		Semiconductor "L" P.C. board ass'y
43	TSC-41A		S.E.A. control P.C. board ass'y
44	TSC-42A		Input selector P.C. board ass'y
47	E60198-001		Bracket
50	E60196-001		Z-bracket
51	E60197-001		U-bracket
52	E34188-001		Bracket
53	E60199-001		"
54	E60200-001		Stay bracket
55	E60200-002		
57	E60205-002		U-bracket
60	E50670-003		Wire clamp
67	E3400-307		Spacer
71	E60210-001		Rubber bushing
74	E60203-001		Slide knob
75	E60202-001		Knob arm
76	E60187-001		Push knob ass'y
77	E49013-005		Coil spring
88	E60185-001		Indicator
89	E60186-001		Push knob escutcheon
90	E60476-001		Plate
98	E44182-012S		Stud

7-(2) Rear Panel

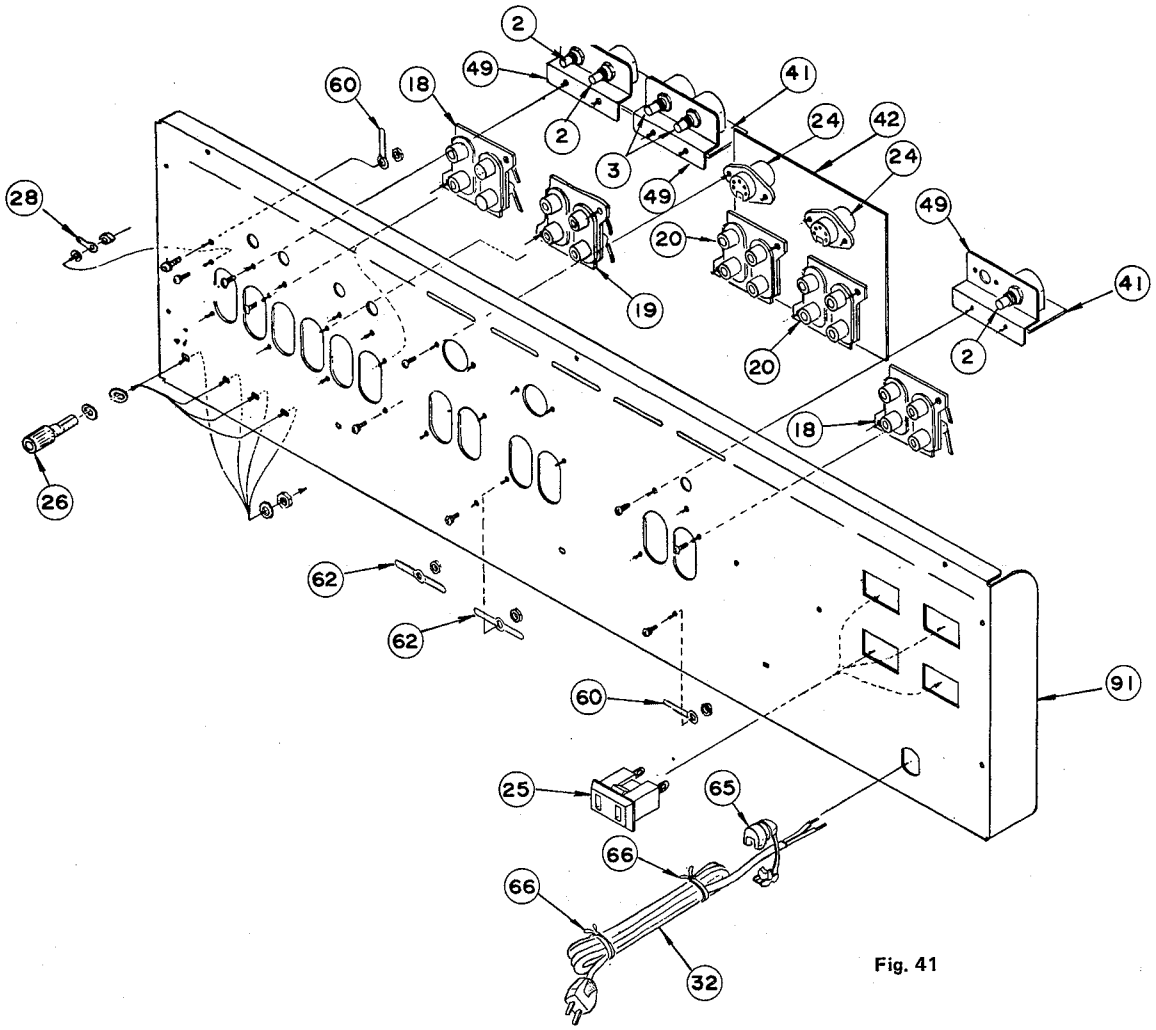


Fig. 41

Parts List

Item No.	Part Number	Rating	Description
2	QVZ1622-001	50k (B)	V. resistor
3	QVZ1622-002	250k (B)	"
18	E03591-41C		Pin jack ass'y
19	E03591-40C		"
20	E03591-41D		"
24	E03623-002		DIN socket
25	QMC0235-002		Socket
26	E03619-001		GND terminal
28	E43727-002		Tab
32	QMP1700-244	For U.S.A.	Power cord
	E03329-001	For European countries	"
	E03551-002	For Australia	"
41	TSC-39A		Level volume P.C. board ass'y
42	TSC-40A		Recording terminals P.C. board ass'y
49	E48230-002		VR bracket
60	E50670-003		Wire clamp
62	E47203-003		"
65	QHS4194-323		Cord stopper
66	Q04141-39		Vinylite

7-(3) Chassis Base

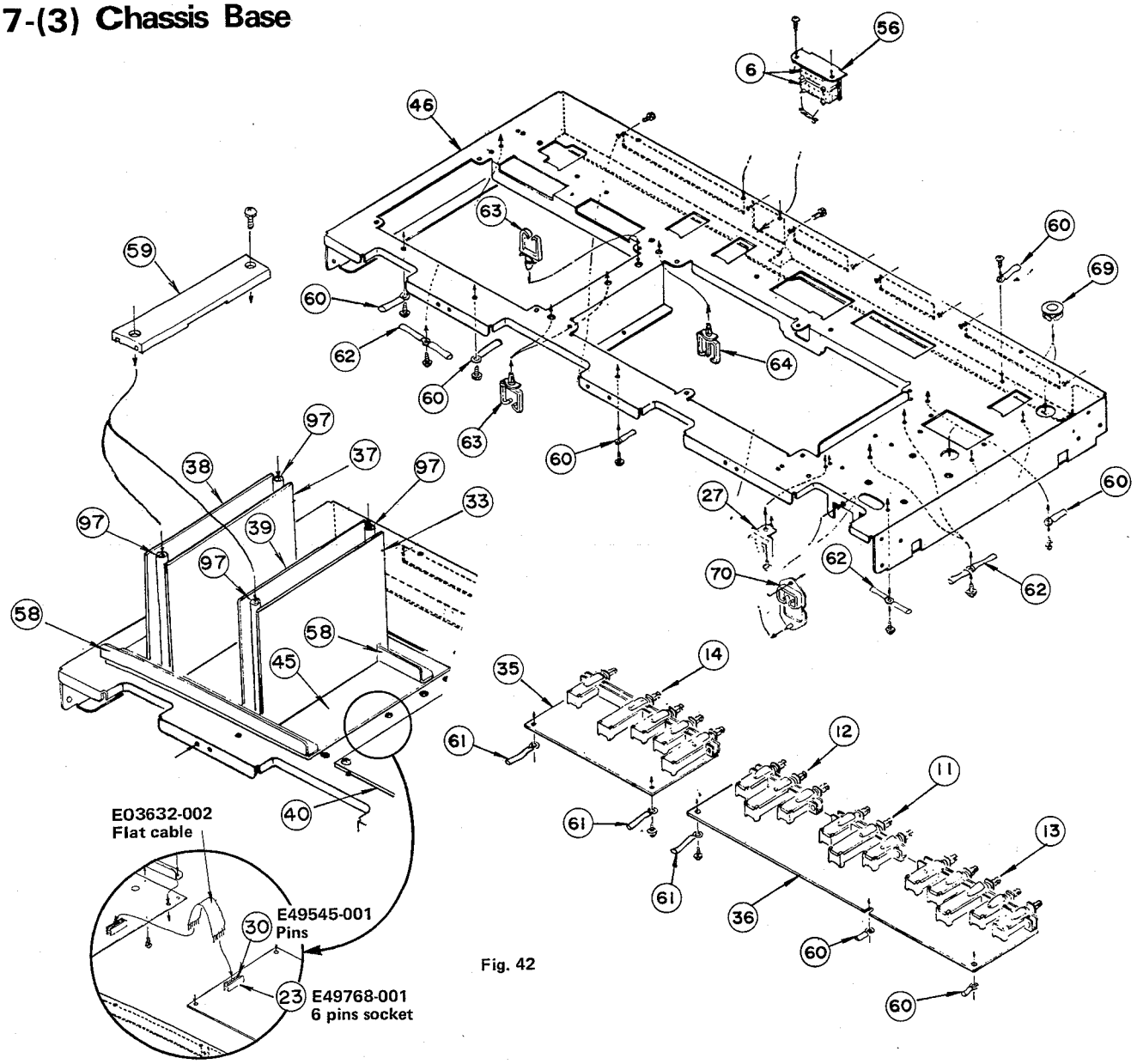


Fig. 42

Parts List

Item No.	Part Number	Rating	Description
11	QSP0016-001		Push switch
12	QSP0016-002		"
13	QSP0017-001		"
14	QSP0018-001		"
27	E46651-001		Wrapping terminal
	E03329-001	For European countries	Power cord
	E03551-002	For Australia	"
35	TAC-390A		Switch P.C. board ass'y
36	TAC-391B		"
46	E10012-001		Chassis base
56	E60204-001		L-bracket
61	E50670-005		Wire clamp
63	E44930-001		"
64	QHW3059-001		"
69	E5629-2		Insulator bushing
70	E60184-001		Cord holder

8. Printed Circuit Board Ass'y Part Locations and Parts List

8-(1) TSC-39A Level Voulume P.C.Board Ass'y

Rear View

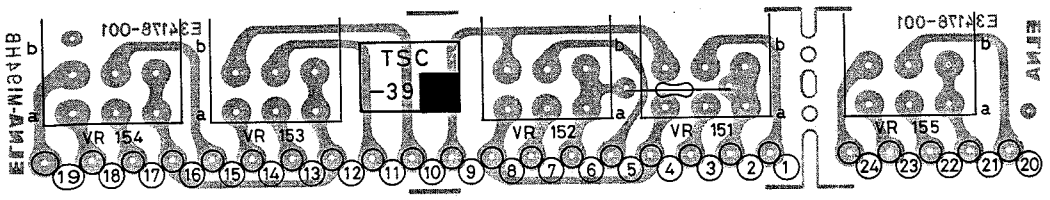


Fig. 43

8-(2) TPS-40A Power Supply P.C.Board Ass'y

Rear View

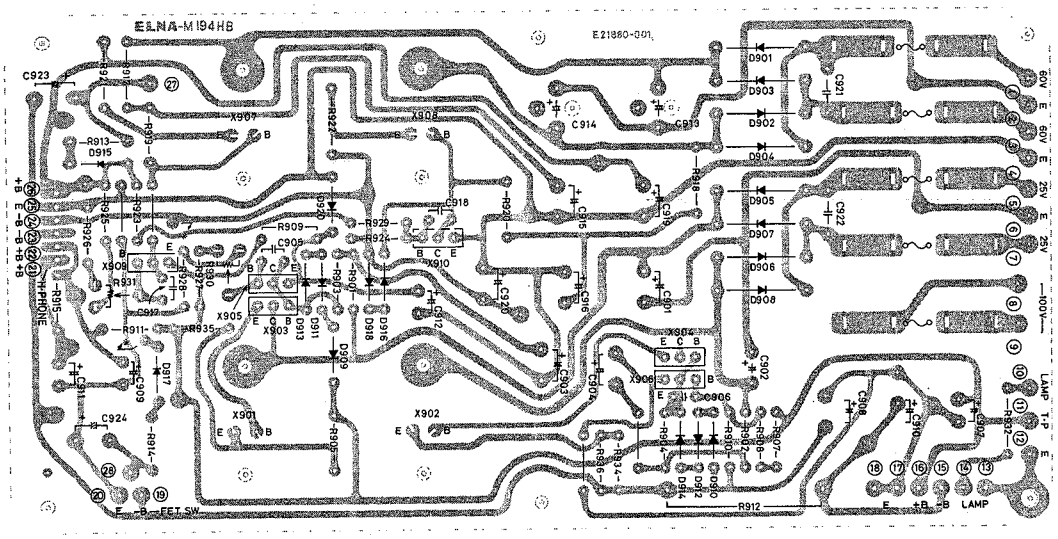


Fig. 44

Precautions:

1. When replacing the fuse in the TPS-40A circuit board, make sure that a fuse of the rating indicated on the board is employed.
2. When connecting 5-pin connector, be sure that connection is with the proper polarity.
   For convenience, a projection is provided on the black housing socket and a sign is printed on the circuit board for the milk-white plug side. Be sure to correctly match the polarity.

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X901	2SD314V (D, E)	30W	8MHz	Silicon	Sanyo
X902	2SB508V (D, E)	30W	8MHz	"	"
X903	2SC1775AV (F)	300mW	200MHz	"	Hitachi
X904	2SA872AV (D, E)	300mW	200MHz	"	"
X905	2SC1775AV (F)	300mW	200MHz	"	"
X906	2SA872AV (D, E)	300mW	200MHz	"	"
X907	2SD382V (L, M)	20W	60MHz	"	NEC
X908	2SB537V (L, M)	20W	60MHz	"	"
X910	2SA872AV (E)	300mW	200MHz	"	Hitachi

Diodes

Item No.	Part Number	Rating	Description	Maker
D901, 902	SiB01-02		Silicon	Fuji
D903, 904	SiB01-02		"	"
D905, 906	SiB01-02		"	"
D907, 908	SiB01-02		"	"
D915, 916	IS2473		"	Toyo Dengu
D917, 918	IS2473		"	"
D920	WZ-130	13V	Zener	JRC

Capacitors

Item No.	Part Number	Rating		Description
C901, 902	QEW41HA-108	1000μF	50V	Electrolytic
C903, 904	QEW41HA-227	220μF	50V	"
C905, 906	QCF11HP-102	0.001μF	50V	Ceramic
C907	QEW41VA-227	220μF	35V	Electrolytic
C908	QEW41EA-108	1000μF	25V	"
C909	QEW41VA-227	220μF	35V	"
C910	QEW41CA-108	1000μF	16V	"
C911	QEW41VA-227	220μF	35V	"
C912	QEW41CA-107	100μF	16V	"
C913, 914	QEW82AA-477	470μF	100V	"
C915, 916	QEW42AA-227	220μF	100V	"
C917, 918	QCF11HP-102	0.001μF	50V	Ceramic
C919, 920	QEW42AA-227	220μF	100V	Electrolytic
C921, 922	QCF12HP-103	0.01μF	500V	Ceramic
C923, 924	QEW41JA-227	220μF	63V	Electrolytic

Resistors

Item No.	Part Number	Rating		Description
R901, 902	QRG129J-122	1.2kΩ	1/2W	UNF. O.M.F.
R903, 904	QRD141J-471	470Ω	1/4W	Carbon
R907	QRD141J-393	39kΩ	1/4W	"
R908	QRD141J-272	2.7kΩ	1/4W	"
R909	QRD141J-332	3.3kΩ	1/4W	"
R910	QRD141J-393	39kΩ	1/4W	"
R912	QRF106K-470	47Ω	10W	Cement
R913, 914	QRG129J-331	330Ω	1/2W	UNF. O.M.F.
R917, 918	QRC121K-682	6.8kΩ	1/2W	Composition
R919, 920	QRD141J-471	470Ω	1/4W	Carbon
R921	QRD146J-100	10Ω	1/4W	UNF. carbon
R922	QRC121K-100	10Ω	1/2W	Composition
R923, 924	QRD141J-104	100kΩ	1/4W	Carbon
R925	QRD141J-333	33kΩ	1/4W	"
R926	QRD141J-183	18kΩ	1/4W	"
R927	QRD141J-123	12kΩ	1/4W	"
R928	QRD141J-183	18kΩ	1/4W	"
R929	QRD141J-332	3.3kΩ	1/4W	"
R930	QVP8A0B-053	5kΩ(B)	1/8W	"
R931	QVP8A0B-014	100kΩ(B)	1/8W	"
R932	QRD146J-470	47Ω	1/4W	UNF. carbon

Others

Item No.	Part Number	Rating	Description
	E03675-002		Fuse clip
	E49768-001		Socket housing
	E49545-001		Pin
	E03628-5		5-pin plug
	E49528-001		Heat sink
	E49024-001		Spacer

8-(3) TSC-40A Recording Terminals P.C.Board Ass'y

Rear View

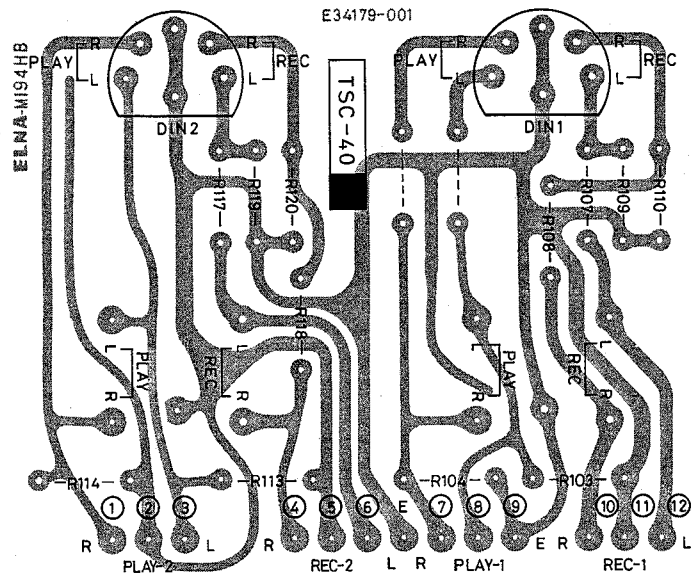


Fig. 45

Resistors

Item No.	Part Number	Rating		Description
R107	QRD141J-334	330kΩ	1/4W	Carbon
R108	QRD141J-334	〃	〃	〃
R109	QRD141J-823	82kΩ	〃	
R110	QRD141J-823	〃	〃	
R117	QRD141J-334	330kΩ	〃	
R118	QRD141J-334	〃	〃	
R119	QRD141J-823	82kΩ	〃	
R120	QRD141J-823	〃	〃	

Others

Item No.	Part Number	Rating	Description
J101	E03623-002		DIN socket
J102	E03623-002		〃
P101	E03591-41D		Pin jack
P102	E03591-41D		〃
	QRD141J-0R0	0Ω	Carbon
VR151	QVZ1622-001	50k(B) x 2	V. resistor
VR152	QVZ1622-001	〃	〃
VR153	QVZ1622-002	250k(B) x 2	〃
VR154	QVZ1622-002	〃	〃
VR155	QVZ1622-001	50k(B) x 2	〃
	E48230-002		V. bracket

8-(4) TSC-41A S.E.A. Control P.C.Board Ass'y

Rear View

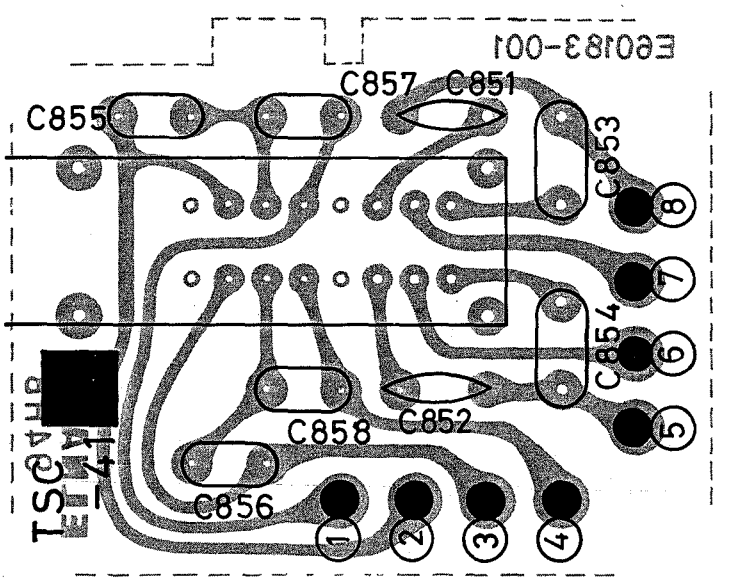


Fig. 46

Capacitors

Item No.	Part Number	Rating		Description
C851, 852	QCS11HJ-681	680pF	50V	Ceramic
C853, 854	QFM41HK-182	0.0018μF	"	Mylar
C855, 856	QFM41HK-183	0.018μF	"	"
C857, 858	QFM41HK-473	0.047μ	"	"

Switch

Item No.	Part Number	Rating	Description
S851	QSL0004-001		Lever switch

8-(5) TSC-42A Input Selector P.C.Board Ass'y

Rear View

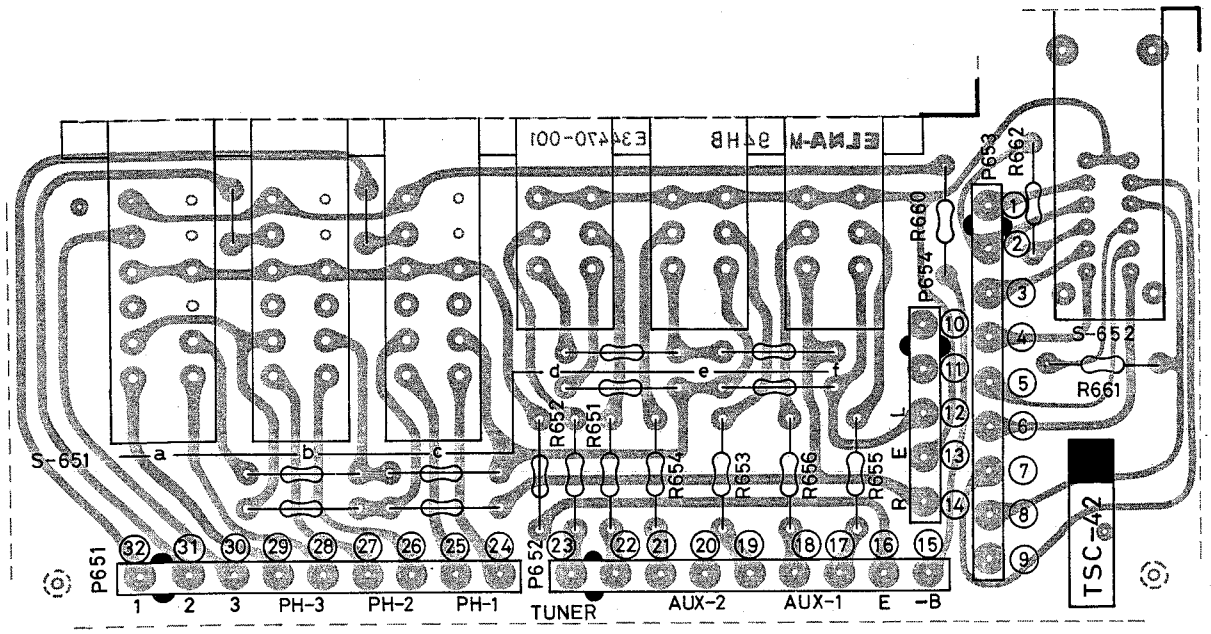


Fig. 47

Precaution:
When connecting 5-pin and 9-pin connectors, be sure that connection is with the proper polarity.
For convenience, a projection is provided on the black housing socket and a sign is printed on the circuit board for the milk-white plug side. Be sure to correctly match the polarity.

Parts List

Item No.	Part Number	Rating	Description
S651	QSP0269-001		Push switch
S652	QSL0005-001		Lever switch
P651	E03628-9		9-pin plug
P652	E03628-9		〃
P653	E03638-9		〃
P654	E03628-5		5-pin plug
	E60199-001		Bracket
	E60205-001		U-bracket
	QRD141J-0R0	0Ω	Carbon

8-(6) TSC-44A Base P.C.Board Ass'y

Rear View

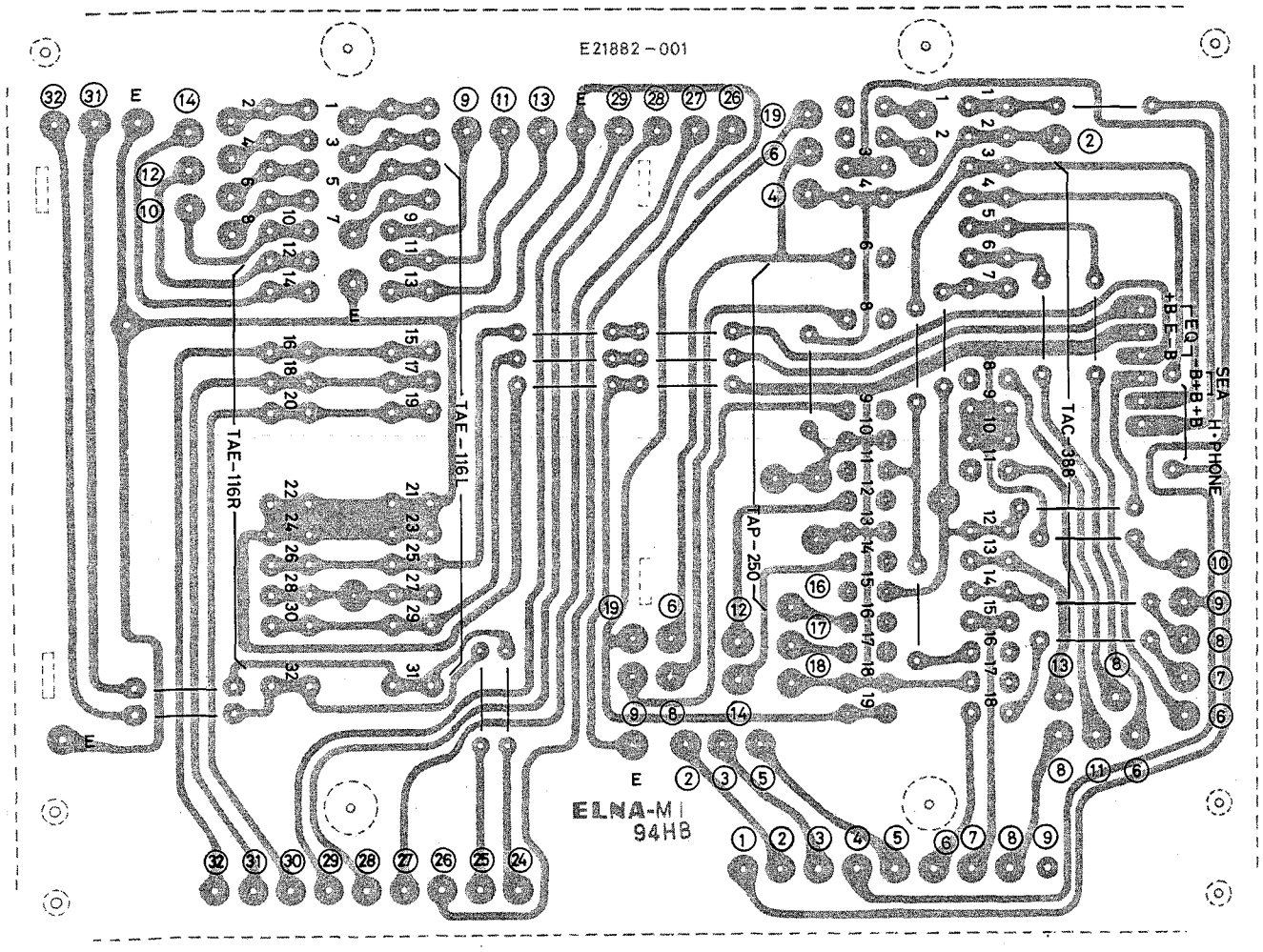


Fig. 48

Precaution:
When connecting 5-pin and 9-pin connectors, be sure that connection is with the proper polarity.
For convenience, a projection is provided on the black housing socket and a sign is printed on the circuit board for the milk-white plug side. Be sure to correctly match the polarity.

Parts List

Item No.	Part Number	Rating	Description
	E46687-001		Tab
	E49784-002		Connect pin
	QRD141J-0R0	0Ω	Carbon
P251	E03628-5		5-pin plug
P253	E03628-9		9-pin plug
P254	E03628-9		〃
	E49545-001		Pin
	E49768-001		Socket housing

8-(7) TAE-116LA Equalizer Amp. P.C.Board Ass'y

Front View

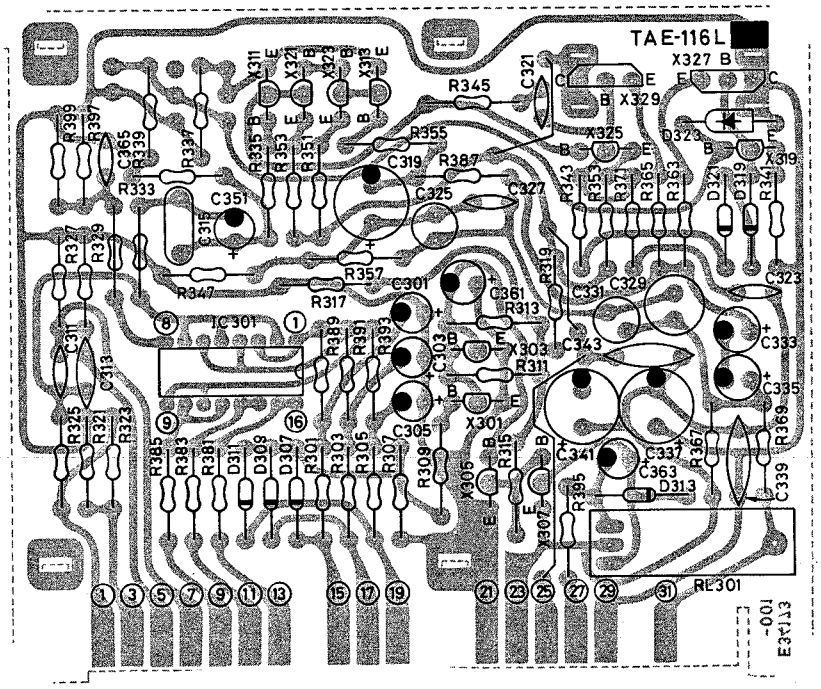


Fig. 49

Precautions:

1. For convenience, use extension connectors to check voltage measurement necessary for servicing the circuit board TAE-116LA.
2. Make sure that all plug-in type circuit boards are properly inserted in the connectors on the main panel with respect to direction and contact.

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X301	2SA872AV (E)	300mW	200MHz	Silicon	Hitachi
X303	2SA872AV (E)	〃	〃	〃	〃
X305	2SA872AV (E)	〃	〃	〃	〃
X307	2SA872AV (E)	〃	〃	〃	〃
X311	2SA872AV (E)	〃	〃	〃	〃
X313	2SA872AV (E)	〃	〃	〃	〃
X319	2SA872AV (E)	〃	〃	〃	〃
X321	2SC1775AV (E)	〃	〃	〃	〃
X323	2SC1775AV (E)	〃	〃	〃	〃
X325	2SC1775AV (E)	〃	〃	〃	〃
X327	2SC1628V (O)	1W	40MHz	〃	Toshiba
X329	2SA818V (O)	〃	〃	〃	〃

Integrated circuit (IC)

Item No.	Part Number	Rating	Description	Maker
IC301	μPD128CV	MOS	I.C.	NEC

Diodes

Item No.	Part Number	Rating	Description	Maker
D307	1S2473		Silicon	Toyo Dengu
D309	1S2473		〃	〃
D311	1S2473		〃	〃
D313	1S2473		〃	〃
D319	1S2473		〃	〃
D321	1S2473		〃	〃
D323	SV-02		Varistor	Sanken

Capacitors

Item No.	Part Number	Rating		Description
C301	QEB41HM-224	0.22μF ±20%	50V	L.L.C. electrolytic
C303	QEB41HM-224	〃	〃	〃
C305	QEB41HM-224	〃	〃	〃
C311	QCS11HJ-101	100pF	〃	Ceramic
C313	QCS11HJ-331	330pF	〃	〃
C315	QFM41JK-105	1μF	63V	Mylar
C319	QEW41EA-107	100μF	25V	Electrolytic
C323	QCS11HJ-101	100pF	50V	Ceramic
C325	QFS42BG-152	1500pF±2%	125V	Poly styrol
C327	QCS11HJ-241	240pF	50V	Ceramic
C329	QFS42BG-472	4700pF±2%	125V	
C331	QFS42BG-471	470pF±2%	〃	
C333	QEB41EM-106	10μF	25V	L.L.C. electrolytic
C335	QEB41EM-106	〃	〃	〃
C337	QEW41JA-476	47μF	63V	Electrolytic
C339	QCF12HP-103	0.01μF	500V	Ceramic
C341	QEW41JA-476	47μF	63V	Electrolytic
C343	QCF12HP-103	0.01μF	500V	Ceramic
C345	QCS11HJ-101	100pF	50V	〃
C347	QCS11HJ-330	33pF	〃	〃
C351	QEB41EM-335	3.3μF±20%	25V	L.L.C. electrolytic
C361	QEB41EM-106	10μF±20%	〃	〃
C363	QEB41HM-105	1μF±20%	50V	〃
C365	QCS11HJ-471	470pF	〃	Ceramic

Resistors

Item No.	Part Number	Rating		Description
R301	QRD141J-474	470kΩ	1/4W	Carbon
R303	QRD141J-474	〃	〃	〃
R305	QRD141J-474	〃	〃	〃
R307	QRD141J-104	100kΩ	〃	〃
R309	QRD141J-473	47kΩ	〃	〃
R311	QRD141J-473	〃	〃	〃
R313	QRD141J-224	220kΩ	〃	〃
R315	QRD141J-473	47kΩ	〃	〃
R317	QRD141J-223	22kΩ	〃	〃
R319	QRD141J-473	47kΩ	〃	〃
R321	QRD141J-683	68kΩ	〃	〃
R323	QRD141J-183	18kΩ	〃	〃
R325	QRD141J-393	39kΩ	〃	〃
R327	QRC121K-475E	4.7MΩ	1/2W	Composition
R329	QRC121K-475E	〃	〃	〃
R335	QRD141J-102	1kΩ	1/4W	Carbon
R337	QRD141J-184	180kΩ	〃	〃
R339	QRZ0019-473	47kΩ	〃	〃
R341	QRD141J-471	470Ω	〃	〃
R343	QRD141J-471	〃	〃	〃
R347	QRD141J-561	560Ω	〃	〃
R349	QRD141J-820	82Ω	〃	〃
R351	QRD141J-820	〃	〃	〃
R353	QRD141J-561	560Ω	〃	〃
R355	QRD141J-0R0	0Ω	〃	〃
R357	QRX148F-4702	47kΩ±1%	〃	M. film
R363	QRD141J-470	47Ω	〃	Carbon
R365	QRD141J-470	〃	〃	〃
R367	QRZ0019-224	220kΩ	〃	〃
R369	QRD141J-331	330Ω	〃	〃
R371	QRD141J-681	680Ω	〃	〃
R387	QRX148F-5493	549kΩ±1%	〃	M. film
R389	QRD141J-225	2.2MΩ	〃	Carbon
R391	QRD141J-225	〃	〃	〃
R393	QRD141J-225	〃	〃	〃
R395	QRD141J-101	100Ω	〃	〃
R397	QRZ0019-155	1.5MΩ	〃	〃
R399	QRD141J-224	220kΩ	〃	〃

Other

Item No.	Part Number	Rating	Description
RL301	ESK2D24-111	24V	Reed relay

8-(8) TAE-116RA Equalizer Amp. P.C.Board Ass'y

Front View

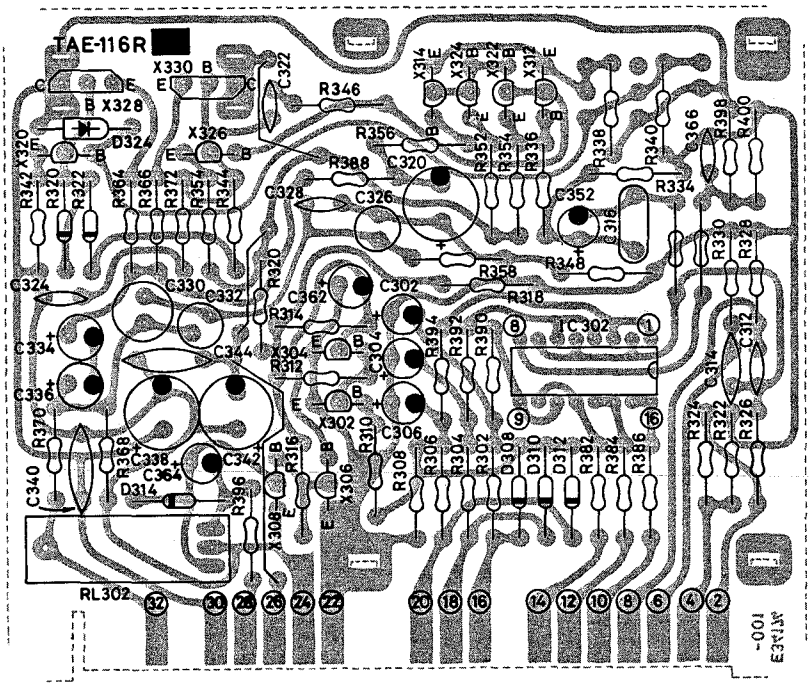


Fig. 50

Precautions:

1. For convenience, use extension connectors to check voltage measurement necessary for servicing the circuit board TAE-116RA.
2. Make sure that all plug-in type circuit boards are properly inserted in the connectors on the main panel with respect to direction and contact.

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X302	2SA872AV (E)	300mW	200MHz	Silicon	Hitachi
X304	2SA872AV (E)	"	"	"	"
X306	2SA872AV (E)	"	"	"	"
X308	2SA872AV (E)	"	"	"	"
X312	2SA872AV (E)	"	"	"	"
X314	2SA872AV (E)	"	"	"	"
X320	2SA872AV (E)	"	"	"	"
X322	2SC1775AV (E)	"	"	"	"
X324	2SC1775AV (E)	"	"	"	"
X326	2SC1775AV (E)	"	"	"	"
X328	2SC1628V (O)	1W	40MHz	"	Toshiba
X330	2SA818V (O)	"	"	"	"

Integrated circuit (IC)

Item No.	Part Number	Rating	Description	Maker
IC302	μPD128CV	MOS	I.C.	NEC

Diodes

Item No.	Part Number	Rating	Description	Maker
D308	1S2473		Silicon	Toyo Dengu
D310	1S2473		〃	〃
D312	1S2473		〃	〃
D314	1S2473		〃	〃
D320	1S2473		〃	〃
D322	1S2473		〃	〃
D324	SV-02		Varistor	Sanken

Capacitors

Item No.	Part Number	Rating		Description
C302	QEB41HM-224	0.22μF±20%	50V	L.L.C. electrolytic
C304	QEB41HM-224	〃	〃	〃
C306	QEB41HM-224	〃	〃	〃
C312	QCS11HJ-101	100pF	〃	Ceramic
C314	QCS11HJ-331	330pF	〃	〃
C316	QFM41JK-105	1μF	63V	Mylar
C320	QEW41EA-107	100μF	25V	Electrolytic
C324	QCS11HJ-101	100pF	50V	Ceramic
C326	QFS42BG-152	1500pF±2%	125V	Poly styrol
C328	QCS11HJ-241	240pF	50V	Ceramic
C330	QFS42BG-472	4700pF±2%	125V	
C332	QFS42BG-471	470pF±2%	〃	
C334	QEB41EM-106	10μF	25V	L.L.C. electrolytic
C336	QEB41EM-106	〃	〃	〃
C338	QEW41JA-476	47μF	63V	Electrolytic
C340	QCF12HP-103	0.01μF	500V	Ceramic
C342	QEW41JA-476	47μF	63V	Electrolytic
C344	QCF12HP-103	0.01μF	500V	Ceramic
C346	QCS11HJ-101	100pF	50V	〃
C348	QCS11HJ-330	33pF	〃	〃
C352	QEB41EM-335	3.3μF±20%	25V	L.L.C. electrolytic
C362	QEB41EM-106	10μF±20%	〃	〃
C364	QEB41HM-105	1μF±20%	50V	〃
C366	QCS11HJ-471	470pF	〃	Ceramic

Resistors

Item No.	Part Number	Rating		Description
R302	QRD141J-474	470kΩ	1/4W	Carbon
R304	QRD141J-474	〃	〃	〃
R306	QRD141J-474	〃	〃	〃
R306	QRD141J-104	100kΩ	〃	〃
R310	QRD141J-473	47kΩ	〃	〃
R312	QRD141J-473	〃	〃	〃
R314	QRD141J-224	220kΩ	〃	〃
R316	QRD141J-473	47kΩ	〃	〃
R318	QRD141J-223	22kΩ	〃	〃
R320	QRD141J-473	47kΩ	〃	〃
R322	QRD141J-683	68kΩ	〃	〃
R324	QRD141J-183	18kΩ	〃	〃
R326	QRD141J-393	39kΩ	〃	〃
R328	QRC121K-475E	4.7MΩ	1/2W	Composition
R330	QRC121K-475E	〃	〃	〃
R336	QRD141J-102	1kΩ	1/4W	Carbon
R338	QRD141J-184	180kΩ	〃	〃
R340	QRZ0019-473	47kΩ	〃	〃
R342	QRD141J-471	470Ω	〃	〃
R344	QRD141J-471	〃	〃	〃
R348	QRD141J-561	560Ω	〃	〃
R350	QRD141J-820	82Ω	〃	〃
R352	QRD141J-820	〃	〃	〃
R354	QRD141J-561	560Ω	〃	〃
R356	QRD141J-0R0	0Ω	〃	〃
R358	QRX148F-4702	47kΩ±1%	〃	M. film
R364	QRD141J-470	47Ω	〃	Carbon
R366	QRD141J-470	〃	〃	〃
R368	QRZ0019-224	220kΩ	〃	〃
R370	QRD141J-331	330Ω	〃	〃
R372	QRD141J-681	680Ω	〃	〃
R388	QRX148F-5493	549kΩ±1%	〃	M. film
R390	QRD141J-225	2.2MΩ	〃	Carbon
R392	QRD141J-225	〃	〃	〃
R394	QRD141J-225	〃	〃	〃
R396	QRD141J-101	100Ω	〃	〃
R398	QRZ0019-155	1.5MΩ	〃	〃
R400	QRD141J-224	220kΩ	〃	〃

Other

Item No.	Part Number	Rating	Description
RL302	ESK2D24-111	24V	Reed relay

8-(9) TAP-250B Buffer Amp. & Headphones P.C.Board Ass'y

Rear View

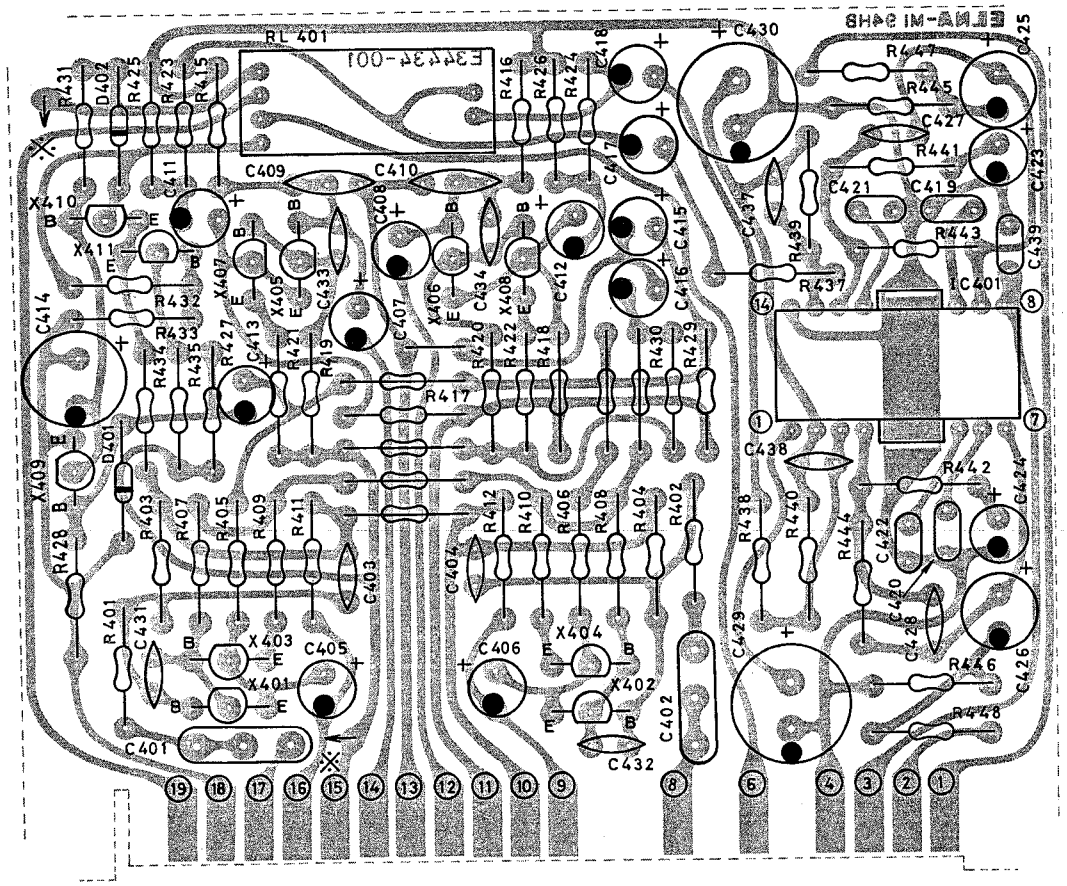


Fig. 51

Precautions:

1. For convenience, use extension connectors to check voltage measurement necessary for servicing the circuit board TAP-250.
2. Make sure that all plug-in type circuit boards are properly inserted in the connectors on the main panel with respect to direction and contact.

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X401, 402	2SA872AV (D)	300mW	200MHz	Silicon	Hitachi
X403, 404	2SC1775AV (F)	"	"	"	"
X405, 406	2SA872AV (D)	"	"	"	"
X407, 408	2SC1775AV (F)	"	"	"	"
X409, 410	2SA872AV (D)	"	"	"	"
X411	2SA872AV (E)	"	"	"	"

Integrated circuit (IC)

Item No.	Part Number	Rating	Description	Maker
IC401	TA7203P	VCC = 18V	I.C.	Toshiba

Diodes

Item No.	Part Number	Rating	Description	Maker
D401	1S2473		Silicon	Toyo Dengu
D402	1S2473		"	"

Capacitors

Item No.	Part Number	Rating		Description
C401, 402	QFH41JK-105	1μF	63V	Mylar
C405, 406	QEB41EM-106	10μF±20%	25V	L.L.C. electrolytic
C407, 408	QEB41HM-105	1μF ±20%	50V	〃
C409, 410	QCS11HJ-101	100pF	〃	Ceramic
C411, 412	QEB41EM-106	10μF±20%	25V	L.L.C. electrolytic
C413	QEB41EM-106	10μF±20%	〃	〃
C414	QEW40JA-477	470μF	6.3V	Electrolytic
C415, 416	QEB41EA-106	10μF	25V	〃
C417, 418	QEB41HM-474	0.47μF	50V	L.L.C. electrolytic
C419, 420	QFM41HK-223	0.022μF	〃	Mylar
C421, 422	QFM41HK-332	0.003μF	〃	〃
C423, 424	QEW41EA-106	10μF	25V	Electrolytic
C425, 426	QEW41CA-476	47μF	16V	〃
C429	QEW41EA-227	220μF	25V	〃
C430	QEW41CA-477	470μF	16V	〃
C431, 432	QCS11HJ-100	10pF	50V	Ceramic
C433, 434	QCS11HJ-100	〃	〃	〃
C437, 438	QCS11HJ-220	22pF	〃	〃
C439	QFM41HK-103	0.01μF	〃	Mylar
C441, 442	QFM41HK-102	0.001μF	〃	〃

Resistors

Item No.	Part Number	Rating		Description
R401, 402	QRD141J-272	2.7kΩ	1/4W	Carbon
R403, 404	QRD141J-474	470Ω	〃	〃
R405, 406	QRD141J-562	5.6kΩ	〃	〃
R407, 408	QRD141J-682	6.8kΩ	〃	〃
R409, 410	QRD141J-151	150Ω	〃	〃
R411, 412	QRD141J-563	56kΩ	〃	〃
R415, 416	QRD141J-474	470kΩ	〃	〃
R417, 418	QRD141J-562	5.6kΩ	〃	〃
R419, 420	QRD141J-682	6.8kΩ	〃	〃
R421, 422	QRD141J-151	150Ω	〃	〃
R423, 424	QRD141J-100	10Ω	〃	〃
R425, 426	QRD141J-563	56kΩ	〃	〃
R428	QRD141J-103	10kΩ	〃	〃
R429, 430	QRD146J-101	100Ω	〃	〃
R431	QRD141J-683	68kΩ	〃	〃
R432	QRD141J-223	22kΩ	〃	〃
R433	QRD141J-103	10kΩ	〃	〃
R434	QRD141J-680	68Ω	〃	〃
R435	QRD141J-182	1.8kΩ	〃	〃
R437, 438	QRD141J-154	150kΩ	〃	〃
R439, 440	QRD141J-563	56kΩ	〃	〃
R441, 442	QRD141J-332	3.3kΩ	〃	〃
R443, 444	QRD141J-563	56kΩ	〃	〃
R445, 446	QRD141J-102	1kΩ	〃	〃
R447, 448	QRD141J-470	47Ω	〃	〃

Other

Item No.	Part Number	Rating	Description
RL401	ESK2D24-211	24V	Reed relay

8-(10) TAC-388A S.E.A. & Flat Amp. P.C.Board Ass'y

Rear View

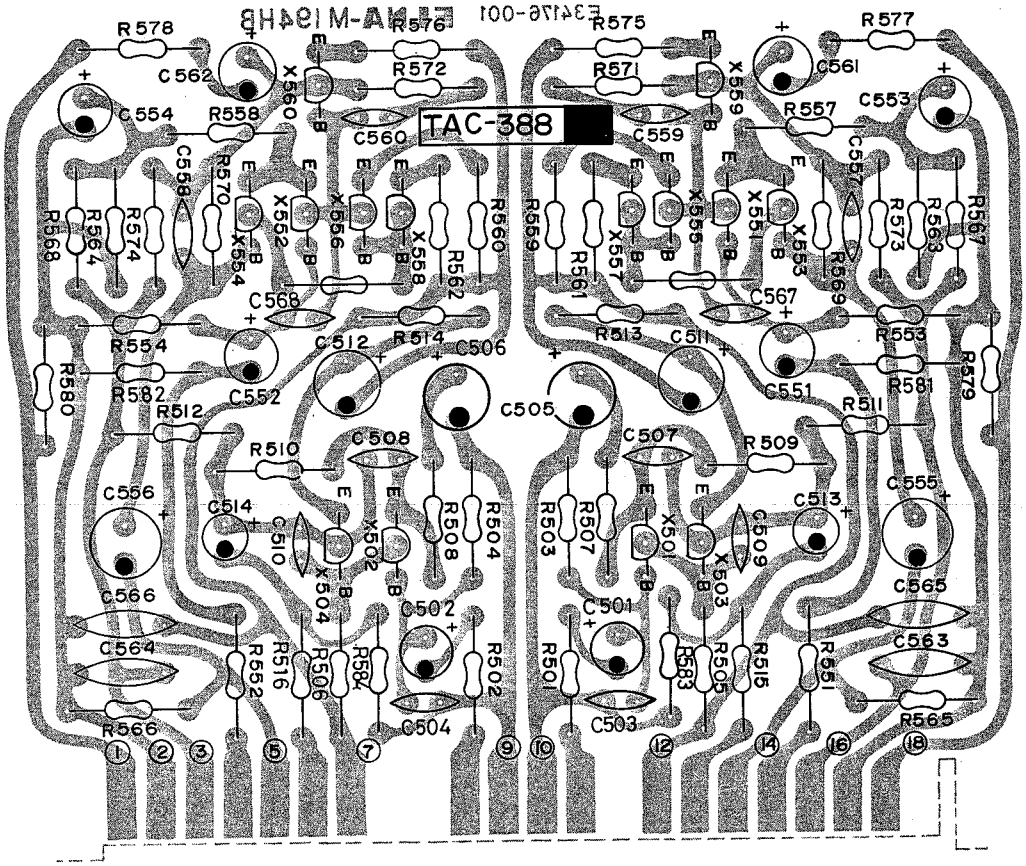


Fig. 52

Precautions:

1. For convenience, use extension connectors to check voltage measurement necessary for servicing the circuit board TAC-388A.
2. Connectors employed in this unit may be reverse connected if forced. To avoid this, carefully follow the indications printed on the board. Reverse connection results in unit malfunctions. If the S.E.A. power connector is reversed, the power indicator will not light and the S.E.A. circuit will not function.
   The symptoms are easily detected.

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X501, 502	2SA872AV (D)	300mW	200MHz	Silicon	Hitachi
X503, 504	2SC1775AV (F)	"	"	"	"
X551, 552	2SA872AV (D)	"	"	"	"
X553, 554	2SA872AV (D)	"	"	"	"
X555, 556	2SC1775AV (F)	"	"	"	"
X557, 558	2SC1775AV (F)	"	"	"	"
X559, 560	2SC1775AV (F)	"	"	"	"

Capacitors

Item No.	Part Number	Rating		Description
C501, 502	QEB41HM-474	0.47μF	50V	L.L.C. electrolytic
C505, 506	QEW41CA-107	100μF	16V	Electrolytic
C507, 508	QCS11HJ-220	22pF	50V	Ceramic
C509, 510	QCS11HJ-5R0	5pF	〃	〃
C511, 512	QEW41CA-107	100μF	16V	Electrolytic
C513, 514	QEB41EM-225	2.2μF	25V	L.L.C. electrolytic
C551, 552	QEB41EM-225	〃	〃	〃
C553, 554	QEB41EM-225	〃	〃	〃
C555, 556	QEW41CA-476	47μF	16V	Electrolytic
C557, 558	QCS11HJ-220	22pF	50V	Ceramic
C559, 560	QCS11HJ-100	10pF	〃	〃
C561, 562	QEB41EM-106	10μF	25V	L.L.C. electrolytic
C563, 564	QCF11HP-473	0.047μF	50V	Ceramic
C565, 566	QCF11HP-473	〃	〃	〃
C567, 568	QCS11HJ-100	10pF	〃	〃
C569, 570	QFM41HJ-334	0.33μF	〃	Mylar

Resistors

Item No.	Part Number	Rating		Description
R501, 502	QRD141J-102	1kΩ	1/4W	Carbon
R503, 504	QRD141J-474	470kΩ	〃	〃
R505, 506	QRD141J-823	82kΩ	〃	〃
R507, 508	QRD141J-222	2.2kΩ	〃	〃
R509, 510	QRD141J-103	10kΩ	〃	〃
R511, 512	QRD141J-562	5.6kΩ	〃	〃
R513, 514	QRD141J-122	1.2kΩ	〃	〃
R551, 552	QRD141J-222	2.2kΩ	〃	〃
R553, 554	QRD141J-474	470kΩ	〃	〃
R557, 558	QRD141J-473	47kΩ	〃	〃
R559, 560	QRD141J-560	56Ω	〃	〃
R561, 562	QRD141J-560	〃	〃	〃
R563, 564	QRD141J-123	12kΩ	〃	〃
R565, 566	QRD141J-563	56kΩ	〃	〃
R567, 568	QRD141J-822	8.2kΩ	〃	〃
R569, 570	QRD141J-682	6.8kΩ	〃	〃
R571, 572	QRD141J-222	2.2kΩ	〃	〃
R573, 574	QRG126J-472	4.7kΩ	1/2W	UNF. O.M.F.
R575, 576	QRD141J-561	560Ω	1/4W	Carbon
R577, 578	QRD141J-682	6.8kΩ	〃	〃
R579, 580	QRD141J-823	82kΩ	〃	〃
R581, 582	QRD141J-474	470kΩ	〃	〃
R583, 584	QRD141J-563	56kΩ	〃	〃

8-(11) TAC-389A Semiconductor "L" P.C.Board Ass'y

Rear View of Amp. Circuit

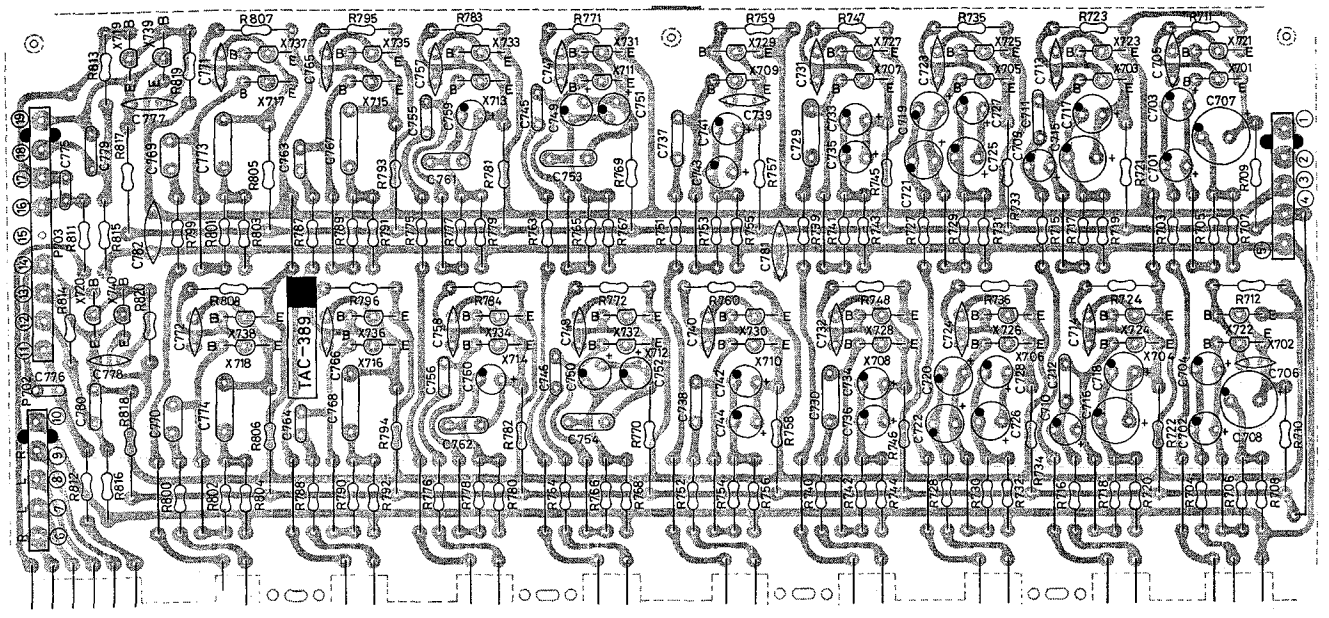


Fig. 53

Precaution:
Connectors employed in this unit may be reverse connected if forced. To avoid this, carefully follow the indications printed on the board. Reverse connection results in unit malfunctions.

Rear View of Volume Circuit

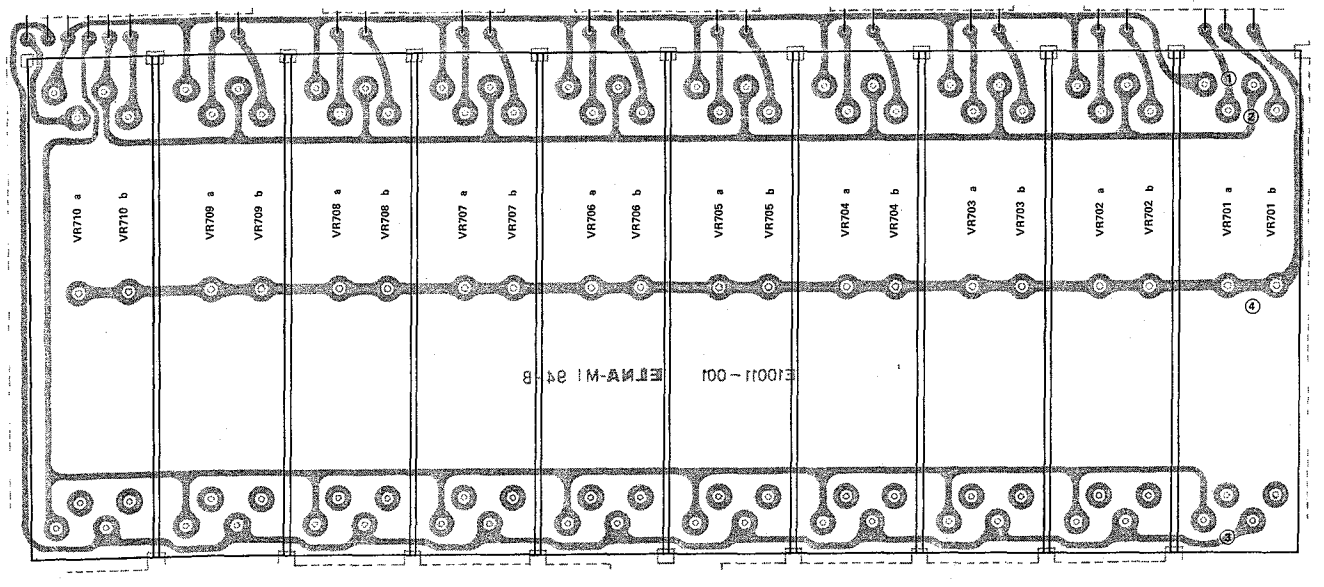


Fig. 54

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X701–720	2SA493 (GR)	200mW	150MHz	Silicon	Toshiba
X721–740	2SC982	300mW	100MHz	Darlington	〃

Capacitors

Item No.	Part Number	Rating		Description
C701, 702	QEB41HM-105M	1μF	50V	L.L.C. electrolytic
C703, 704	QEB41HM-105M	〃	〃	〃
C705, 706	QCS11HJ-470	47pF	〃	Ceramic
C707, 708	QEB41EM-476M	47μF	25V	L.L.C. electrolytic
C709, 710	QEB41HM-684M	0.68μF	50V	〃
C711, 712	QFM41HK-104	0.1μF	〃	Mylar
C713, 714	QCS11HJ-470	47pF	〃	Ceramic
C715, 716	QEB41EM-226M	22μF	25V	L.L.C. electrolytic
C717, 718	QEB41EM-475M	4.7μF	〃	〃
C719, 720	QEB41HM-224M	0.22μF	50V	〃
C721, 722	QEB41HM-224M	〃	〃	〃
C723, 724	QCS11HJ-470	47pF	〃	Ceramic
C725, 726	QEB41EM-106M	10μF	25V	L.L.C. electrolytic
C727, 728	QEB41EM-225M	2.2μF	〃	〃
C729, 730	QFM41HK-184	0.18μF	50V	Mylar
C731, 732	QCS11HJ-470	47pF	〃	Ceramic
C733, 734	QEB41EM-225M	2.2μF	25V	L.L.C. electrolytic
C735, 736	QEB41EM-475M	4.7μF	〃	〃
C737, 738	QFM41HK-124	0.12μF	50V	Mylar
C739, 740	QCS11HJ-470	47pF	〃	Ceramic
C741, 742	QEB41EM-225M	2.2μF	25V	L.L.C. electrolytic
C743, 744	QEB41HM-474M	0.47μF	50V	〃
C745, 746	QFM41HK-563	0.056μF	〃	Mylar
C747, 748	QCS11HJ-470	47pF	〃	Ceramic
C749, 750	QEB41HM-684M	0.68μF	〃	L.L.C. electrolytic
C751, 752	QEB41HM-684M	〃	〃	〃
C753, 754	QFM41HK-104	0.1μF	〃	Mylar
C755, 756	QFM41HK-273	0.027μF	〃	〃
C757, 758	QCS11HJ-470	47pF	〃	Ceramic
C759, 760	QEB41HM-684M	0.68μF	〃	L.L.C. electrolytic
C761, 762	QFM41HK-823	0.082μF	〃	Mylar
C763, 764	QFM41HK-153	0.015μF	〃	〃
C765, 766	QCS11HJ-470	47pF	〃	Ceramic
C767, 768	QFM41HK-334	0.33μF	〃	Mylar
C769, 770	QFM41HK-562	5600pF	〃	〃
C771, 772	QCS11HJ-470	47pF	〃	Ceramic
C773, 774	QFM41HK-224	0.22μF	〃	Mylar
C775, 776	QFM41HK-272	2700pF	〃	〃
C777, 778	QCS11HJ-470	47pF	〃	Ceramic
C779, 780	QFM41HK-683	0.068μF	〃	Mylar
C781, 782	QCF11HP-473	0.047μF	〃	Ceramic
C783	QEW41HA-225	2.2μF	〃	Electrolytic

Resistors

Item No.	Part Number	Rating		Description
R705–708	QRD141J-560	56Ω	1/4W	Carbon
R709, 710	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R711, 712	QRD141J-103	10kΩ	1/4W	Carbon
R715, 716	QRD141J-121	120Ω	"	"
R717–720	QRD141J-560	56Ω	"	"
R721, 722	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R723, 724	QRD141J-103	10kΩ	1/4W	Carbon
R727, 728	QRD141J-470	47Ω	"	"
R729–732	QRD141J-560	56Ω	"	"
R733, 734	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R735, 736	QRG126J-222	2.2kΩ	"	"
R739, 740	QRD141J-100	10Ω	1/4W	"
R741–744	QRD141J-560	56Ω	"	"
R745, 746	QRG126J-222	2.2kΩ	1/2W	"
R747, 748	QRD141J-103	10kΩ	1/4W	Carbon
R751, 752	QRD141J-100	10Ω	"	"
R753–756	QRD141J-560	56Ω	"	"
R757, 758	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R759, 760	QRD141J-103	10kΩ	1/4W	Carbon
R763, 764	QRD141J-470	47Ω	"	"
R765–768	QRD141J-560	56Ω	"	"
R769, 770	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R771, 772	QRD141J-103	10kΩ	1/4W	Carbon
R775, 776	QRD141J-100	10Ω	"	"
R777–780	QRD141J-560	56Ω	"	"
R781, 782	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R783, 784	QRD141J-103	10kΩ	1/4W	Carbon
R787, 788	QRD141J-181	180Ω	"	"
R789–792	QRD141J-560	56Ω	"	"
R793, 794	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R795, 796	QRD141J-103	10kΩ	1/4W	Carbon
R799, 800	QRD141J-181	180Ω	"	"
R801–804	QRD141J-560	56Ω	"	"
R805, 806	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R807, 808	QRD141J-103	10kΩ	1/4W	Carbon
R811, 812	QRD141J-181	180Ω	"	"
R813–816	QRD141J-560	56Ω	"	"
R817, 818	QRG126J-222	2.2kΩ	1/2W	O.M.F.
R819, 820	QRD141J-103	10kΩ	1/4W	Carbon
VR701–710	QVS7C2W-8F5	250kΩ		Slide variable resistor

Others

Item No.	Part Number	Rating		Description
	E34188-001			Bracket
	E60198-001			"
P701, 702	E03628-5			5-pin plug
P703	E03628-9			9-pin plug

8-(12) TAC-390A Switch P.C.Board Ass'y

Rear View

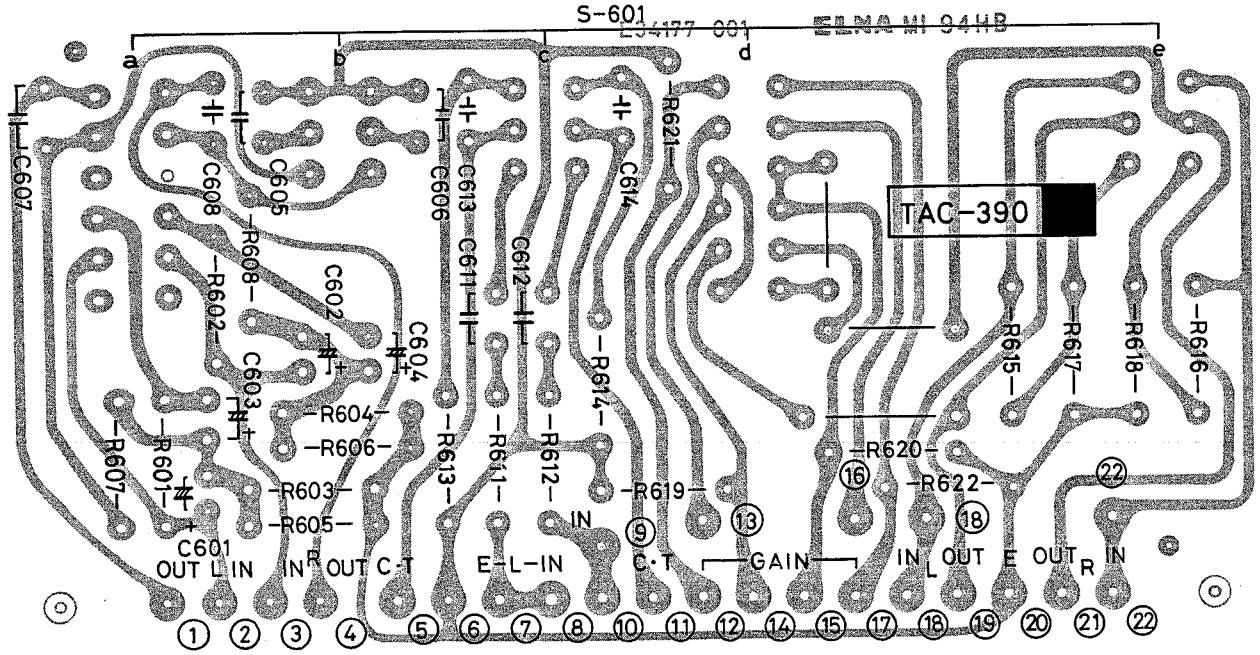


Fig. 55

Capacitors

Item No.	Part Number	Rating		Description
C601, 602	QEB41HM-224	0.22μF	50V	L.L.C. electrolytic
C603, 604	QEB41EM-225	2.2μF	25V	"
C605, 606	QFM41HK-103	0.01μF	50V	Mylar
C607, 608	QFM41HK-393	0.039μF	"	"
C611, 612	QCS11HJ-271	270pF	"	Ceramic
C613, 614	QFM41HK-273	0.027μF	"	Mylar

Resistors

Item No.	Part Number	Rating		Description
R601, 602	QRD141J-474	470kΩ	1/4W	Carbon
R603, 604	QRD141J-683	68kΩ	"	"
R607, 608	QRD141J-182	1.8kΩ	"	"
R611, 612	QRD141J-683	68kΩ	"	"
R613, 614	QRD141J-153	15kΩ	"	"
R615, 616	QRD141J-473	47kΩ	"	"
R617, 618	QRD141J-562	5.6kΩ	"	"

Other

Item No.	Part Number	Rating	Description
S601	QSP0018-001		Push switch

8-(13) TAC-391B Switch P.C.Board Ass'y

Rear View

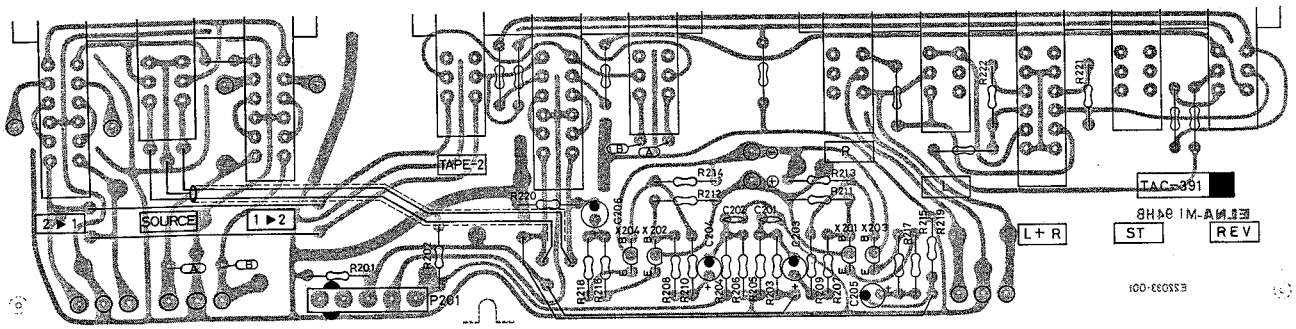


Fig. 56

Transistors

Item No.	Part Number	Rating		Description	Maker
		Pc	fT		
X201, 202	2SC1775AV (E)	300mW	200MHz	Silicon	Hitachi
X203, 204	2SA872AV (E)	"	"	"	"

Capacitors

Item No.	Part Number	Rating		Description
C203, 204	QFH41JK-105	1μF	63V	Mylar
C205, 206	QEB41EM-475	4.7μF	25V	L.L.C. electrolytic

Resistors

Item No.	Part Number	Rating		Description
R203, 204	QRZ0019-222	2.2kΩ	1/4W	Carbon
R205, 206	QRZ0019-474	470kΩ	"	"
R207, 208	QRZ0019-332	3.3kΩ	"	"
R209, 210	QRZ0019-332	"	"	"
R211, 212	QRZ0019-274	270kΩ	"	"
R213, 214	QRZ0019-274	"	"	"
R215, 216	QRD141J-470	47Ω	"	"
R217, 218	QRD141J-470	"	"	"
R219, 220	QRZ0019-563	56kΩ	"	"
R221, 222	QRD141J-472	4.7kΩ	"	"

Others

Item No.	Part Number	Rating	Description
S201	QSP0017-001		Push switch
S202	QSP0016-001		"
S203	QSP0016-002		"
P201	E03628-5		5-pin plug
	E03565-9BO		9-pin socket

9. Accessories List

Part Number	Description	Q'ty
E30580-542A	Instruction Book	1
BT20020C	Warranty Card (U.S.A.)	1
BT20014	" " (PACEX)	
BT20029	" " (Australia)	
BT20013	" " (U.K.)	
E03479-001	Signal Cord	1
E64207-002	Envelope (for Accessories)	1
BT20023	Service Procedure (U.S.A. only)	(1)
BT20024	"DO IT BETTER" (U.S.A. only)	(1)

10. Packing Materials and Part Numbers

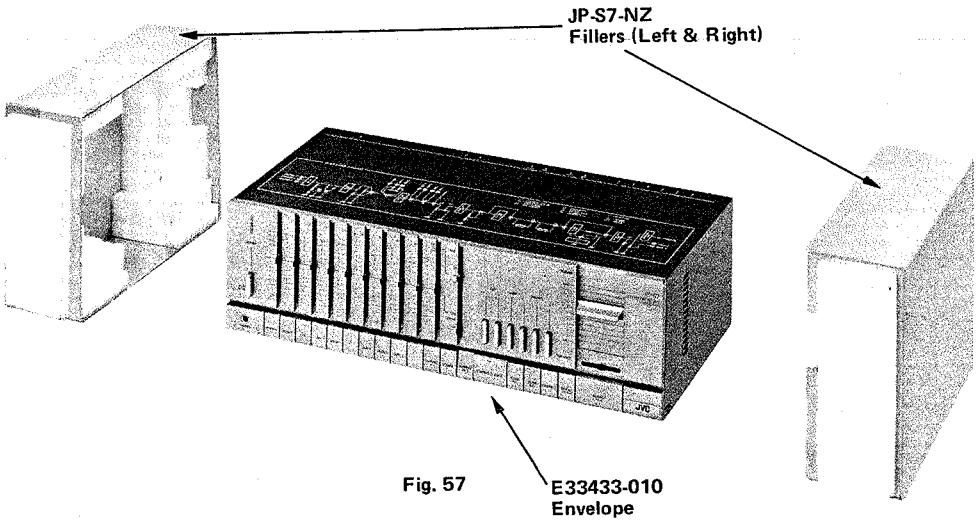


Fig. 57

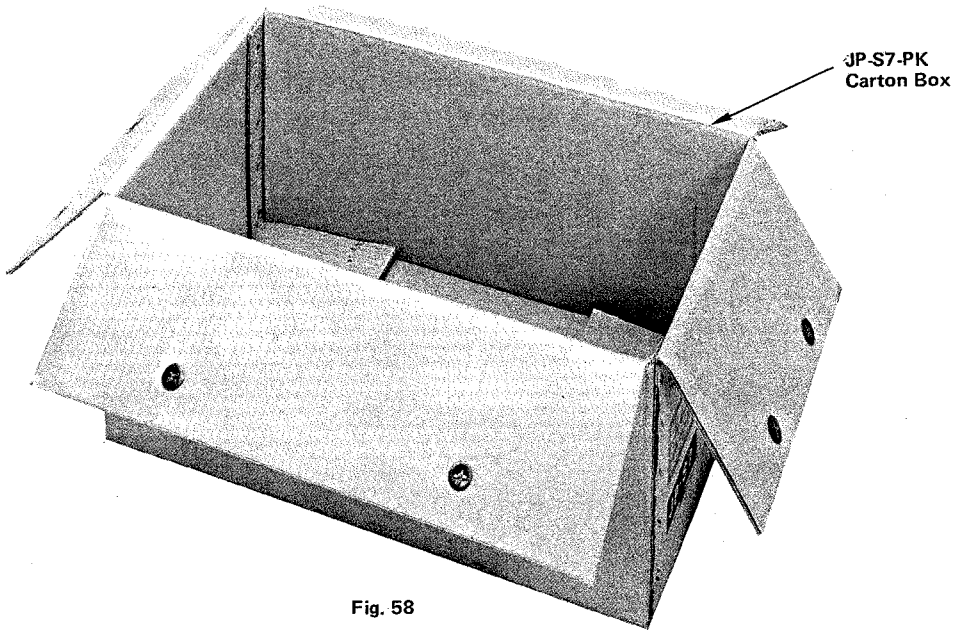
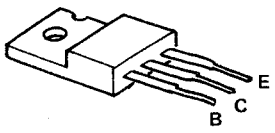
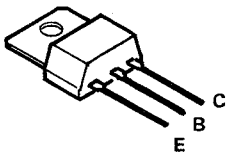


Fig. 58

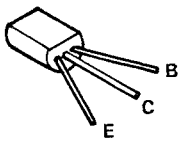
11. Transistor, I.C. and Diode Lead Identification



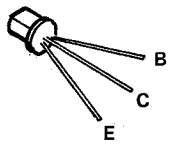
2SB537V (L, M)
2SB508V (D, E)
2SD314V (D, E)
2SD382V (L, M)



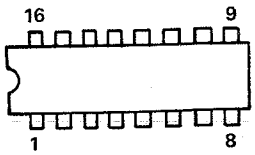
2SA818V (O)
2SC1628V (O)



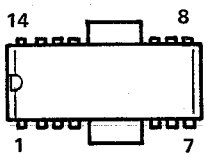
2SA872AV (D, E)
2SC1775AV (E, F)



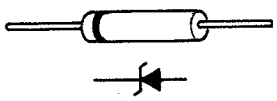
2SA493
2SC982



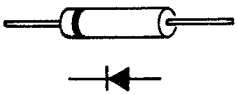
μPD128C



TA7203P

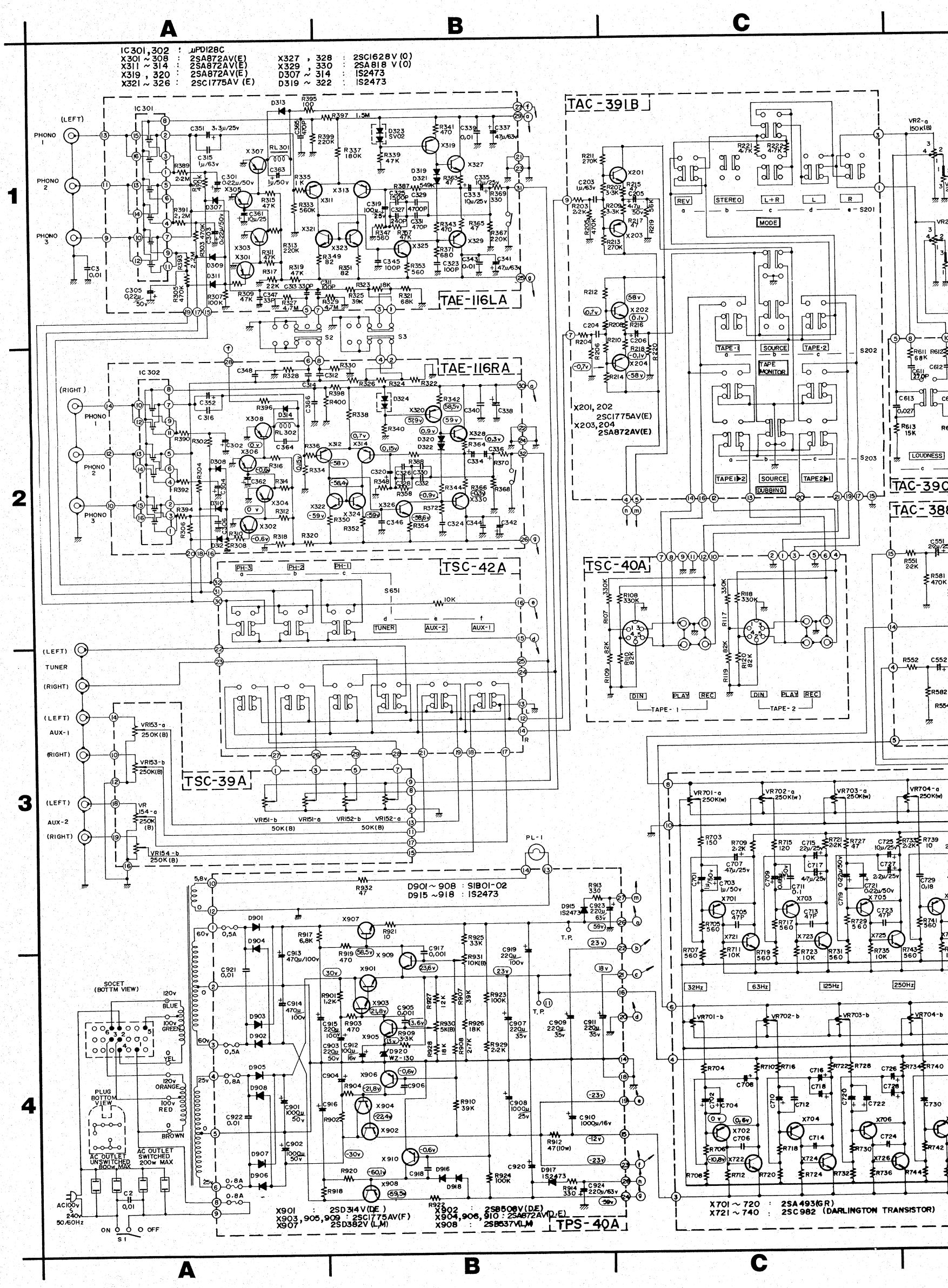


WZ-130 (E0771-12)



1S2473
SIB01-02

12. Schematic Diagrm

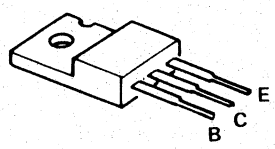


Circuit Board Ass'y Locations

C.B. Ass'y	Description	Page
TSC-39A	Level Volume P.C. Board Ass'y	19
TPS-40A	Power Supply P.C. Board Ass'y	19
TSC-40A	Recording Terminals P.C. Board Ass'y	21
TSC-41A	S.E.A. Control P.C. Board Ass'y	22
TSC-42A	Input Selector P.C. Board Ass'y	23
TSC-44A	Base P.C. Board Ass'y	24
TAE-116LA	Equalizer Amp. P.C. Board Ass'y	25

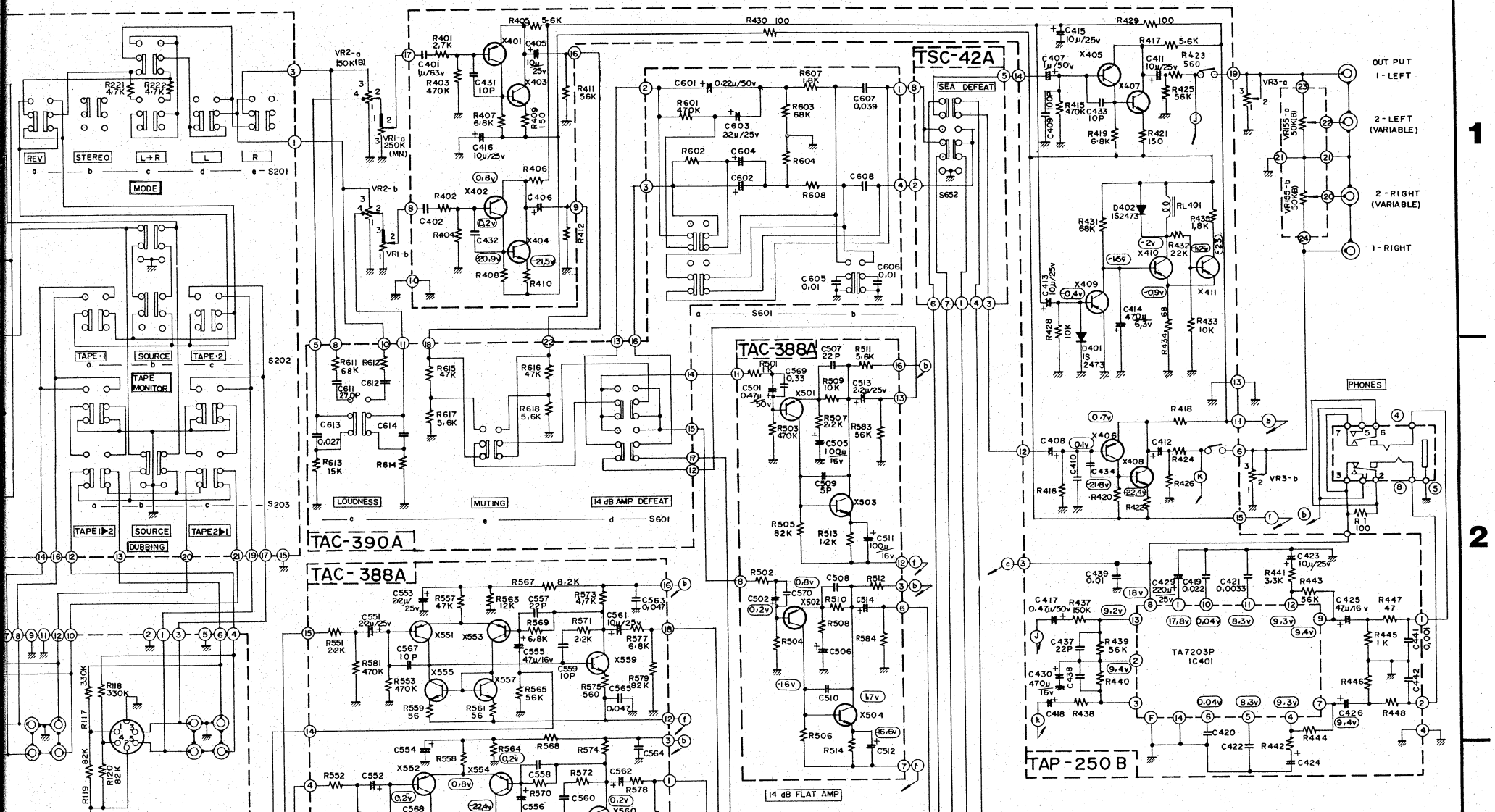
C.B. Ass'y	Description	Page
TAE-116RA	Equalizer Amp. P.C. Board Ass'y	28
TAP-250B	Buffer Amp. & Headphones P.C. Board Ass'y	31
TAC-388A	S.E.A. & Flat Amp. P.C. Board Ass'y	33
TAC-389A	Semiconductor "L" P.C. Board Ass'y	35
TAC-390A	Switch P.C. Board Ass'y	38
TAC-391B	Switch P.C. Board Ass'y	39

Transistor, IC and Diode Lead



2SB537V (L, M)
2SB508V (D, E)
2SD314V (D, E)
2SD382V (L, M)

X401,402,405,406,409,410,411,501,502,551,552,553,554 : 2SA872AV(D)
X403,404,407,408,503,504,555,556,557,558,559,560 : 2SC1775AV(F)



S1 : POWER SW
S2 : CARTRIDGE LOAD 33K, 47K, 100KΩ
S3 : CARTRIDGE LOAD 100PF, OFF, 330PF

S201 : MODE SW
a. REV
b. STEREO
c. L+R
d. L
e. R

S202 : TAPE SW
a. TAPE-1
b. SOURCE
c. TAPE-2

S203 : DUBBING SW
a. 1▶2
b. SOURCE
c. 2▶1

S651 : SOURCE SW
a. PHONO-3
b. PHONO-2
c. PHONO-1
d. TUNER
e. AUX-2
f. AUX-1

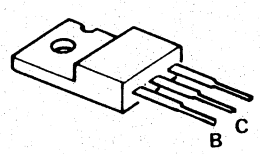
S601 :
a. SUBSONIC FILTER
b. HIGH FILTER
c. LOUDNESS
d. 14 dB AMP DEFEAT
e. MUTING

S652 : SEA DEFEAT SW
S851 : SEA FREQUENCY CHANGE SW
a. 12KHz
b. 16KHz
c. 20KHz

VR-1 : BALANCE
VR-2 : MAIN VOLUME
VR-3 : MAIN VOLUME
VR151 : PHONO-2 LEVEL
VR152 : PHONO-3 LEVEL
VR153 : AUX-1 LEVEL
VR154 : AUX-2 LEVEL
VR155 : OUTPUT LEVEL

X701 ~ 720 : 2SA493(GR)
X721 ~ 740 : 2SC982 (DARLINGTON TRANSISTOR)

Transistor, IC and Diode Lead Identification



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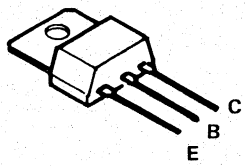
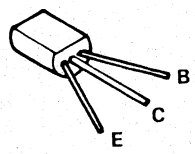
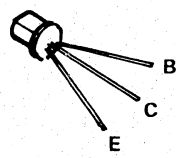
2SB508V (D, E)
2SD314V (D, E)
2SD382V (L, M)



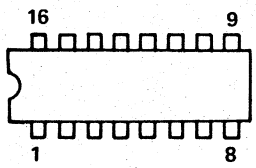
2SA818V (O)
2SC1628V (O)



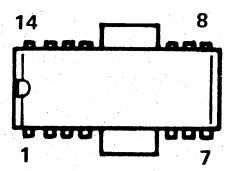
2SA872AV (D, E)
2SC1775AV (E, F)



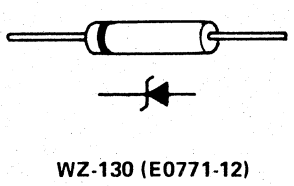
2SA493
2SC982



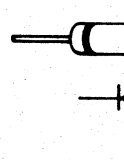
μPD128C



TA7203P

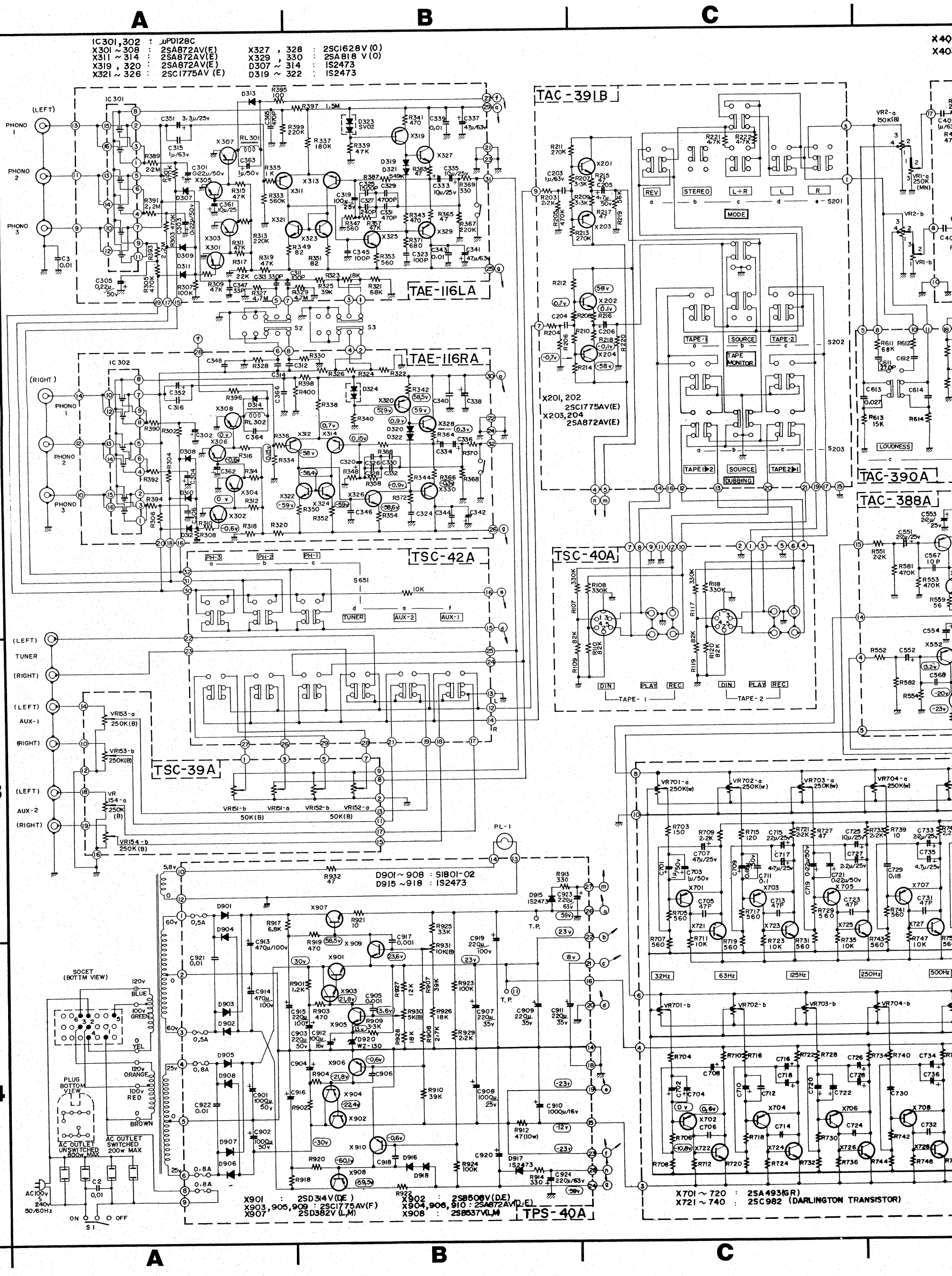


WZ-130 (E0771-12)



1S2
SIB

12. Schematic Diagrm

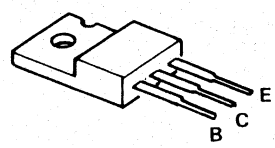


Circuit Board Ass'y Locations

C.B. Ass'y	Description	Page
TSC-39A	Level Volume P.C. Board Ass'y	19
TPS-40A	Power Supply P.C. Board Ass'y	19
TSC-40A	Recording Terminals P.C. Board Ass'y	21
TSC-41A	S.E.A. Control P.C. Board Ass'y	22
TSC-42A	Input Selector P.C. Board Ass'y	23
TSC-44A	Base P.C. Board Ass'y	24
TAE-116LA	Equalizer Amp. P.C. Board Ass'y	25

C.B. Ass'y	Description	Page
TAE-116RA	Equalizer Amp. P.C. Board Ass'y	28
TAP-250B	Buffer Amp. & Headphones P.C. Board Ass'y	31
TAC-388A	S.E.A. & Flat Amp. P.C. Board Ass'y	33
TAC-389A	Semiconductor "L" P.C. Board Ass'y	35
TAC-390A	Switch P.C. Board Ass'y	38
TAC-391B	Switch P.C. Board Ass'y	39

Transistor, IC and Diode Lead Ident



2SB537V (L, M)
2SB508V (D, E)
2SD314V (D, E)
2SD382V (L, M)

2SA818V
2SC1628

X401,402,405,406,409,410,411,501,502,551,552,553,554 : 2SA872AV(D)
X403,404,407,408,503,504,555,556,557,558,559,560 : 2SC1775AV(F)

S1 : POWER SW
S2 : CARTRIDGE LOAD 33K, 47K, 100KΩ
S3 : CARTRIDGE LOAD 100PF, OFF, 330PF

S201 : MODE SW
a.REV
b.STEREO
C.L+R
d.L
e.R

S202 : TAPE SW
a.TAPE-1
b.SOURCE
c.TAPE-2

S203 : DUBBING SW
a.1▶2
b.SOURCE
c.2▶1

S651 : SOURCE SW
a.PHONO-3
b.PHONO-2
c.PHONO-1
d.TUNER
e.AUX-2
f.AUX-1

S601 :
a.SUBSONIC FILTER
b.HIGH FILTER
c.LOUDNESS
d.14dB AMP DEFEAT
e.MUTING

S652 : SEA DEFEAT SW

S851 : SEA FREQUENCY CHANGE SW
a.12KHz
b.16KHz
c.20KHz

VR-1 : BALANCE
VR-2 : MAIN VOLUME
VR-3 : MAIN VOLUME
VR151 : PHONO-2 LEVEL
VR152 : PHONO-3 LEVEL
VR153 : AUX-1 LEVEL
VR154 : AUX-2 LEVEL
VR155 : OUTPUT LEVEL

Transistor, IC and Diode Lead Identification

2SB537V (L, M)
2SB508V (D, E)
2SD314V (D, E)
2SD382V (L, M)

2SA818V (O)
2SC1628V (O)

2SA872AV (D, E)
2SC1775AV (E, F)

2SA493
2SC982

μPD128C

TA7203P

WZ-130 (E0771-12)

1S247
SIB01